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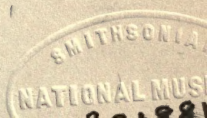
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PROCEEDINGS
OF THE
ENTOMOLOGICAL SOCIETY
OF
WASHINGTON.



Volume VII, 1905.
(Meetings of October 6, 1904, to October 5, 1905.)

WASHINGTON, D. C.
Published by the Society.
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ROLLA P. CURRIE,

E. A. SCHWARZ,

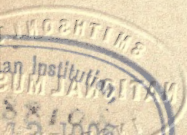
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O. HEIDEMANN,

AUGUST BUSCK,

H. S. BARBER,



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OF THE
ENTOMOLOGICAL SOCIETY
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WASHINGTON.



Volume VII, No. 1.

JANUARY, 1905.

(Meetings of October 6, 1904, to December 1, 1904.)

Published Quarterly by the Society.

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OF WASHINGTON.

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WITH THE COMPLIMENTS
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was used. As matters stand, this pamphlet is of little scientific value (except for specific localities mentioned by Gundlach), since the families, genera and species are listed without any systematic arrangement. If a little circumspection had been used in editing the pamphlet for publication it would have been an excellent check-list of the animals found in Cuba by Gundlach. As to the insects, the Orders Diptera and Coleoptera are not included in the pamphlet, and Mr. Schwarz was informed by the authorities of the "Instituto" that there were no funds to continue and complete the publication of the "Catalogo." The date on the title page of this pamphlet is misleading, as are also the dates on the other works on the Cuban fauna by Dr. Gundlach, published in Havana by the Academy of Sciences or otherwise, the title pages, with the date, being always printed as page 1, while the publication of the body of the volumes extended over several subsequent years.

—Mr. Barber stated that a collection of land shells from Nassau, Bahama Islands, received a few days ago by the Division of Molluscs in the National Museum, was found to be swarming with a small dipteron. The matter was called to his attention, and upon visiting the collection he recognized the flies, by their erratic, jerking movements, as belonging to the family Phoridae. The snails were dead, but not wholly dried up, and there was considerable odor about them. He noticed that although some of the flies flew readily (the ♂♂), others (the ♀♀) were wingless. He collected a number of both forms in different stages, and these were determined by Mr. Coquillett as belonging to *Puliciphora occidentalis* Melander and Brues, originally described, about a year ago, under the genus *Stethopathus*, from three ♀ specimens collected at Wood's Hole, Mass., at a place where burrows of *Halictus* were abundant. It was then inferred that the flies had some symbiotic relation with these bees. A winged ♂ was taken at the same time by the authors just mentioned, but was thought to belong to some other species on account of differences in the head. Mr. Coquillett told Mr. Barber that the head in the ♂♂ collected on the snails differed considerably from that of the ♀♀, and he believed that the specimen obtained by Brues and Melander was the true ♂

of this species. Mr. Barber stated that there are some differences between Melander and Brues' figure of the ♀ and his own specimens in the length of the joints of the front and hind tarsi, the most striking difference being in the basal joint of the hind tarsus, which, in his specimens, is very broad and has a beautiful set of diagonal rows of bristles, similar to that found on the same joint in beetles belonging to the genus *Mordellistena*. Mr. Barber thought it improbable that a wingless ♀ could have had a chance to oviposit in the collection since the introduction of the latter into this country, and he believed that the flies should be labeled as coming from the Bahamas. Microscopic and pinned specimens of adults, ♂ and ♀, and larvæ and pupæ were shown, as also Melander and Brues' published figure.

Discussing this note Mr. Currie mentioned having found Phorid flies in a cigar box of insects sent to the National Museum from the Hawaiian Islands by Dr. Ashmead during the summer of 1901. They had bred from several large dragonflies of the genus *Anax*, eggs of the Phorid having undoubtedly been deposited on them shortly after they were collected and before they were packed for shipment.

—Dr. Stiles entertained the Society with a short account of the work done at the International Zoological Congress which met at Bern, Switzerland, the past summer. He stated that there were 400 members present, 26 of whom were Americans. Unfortunately he was unable to attend any of the meetings devoted to entomology, since his position on the committee on rules of nomenclature kept him closely engaged for 18 days. He mentioned in brief the work of that committee and stated that the code as revised and adopted is now in type and will be published in English, French, and German.

—Dr. Ashmead, under the title "New Hymenoptera from the Philippine Islands," reviewed the work that has been done upon Philippine Hymenoptera and mentioned the sources of material from that region which has come into the possession of the National Museum. He also exhibited a box containing some of the more interesting species from recent sendings and made comments upon them. He called special attention to a specimen of the hitherto undescribed ♀ of the ant *Sima allo-*

borans Walker. In conclusion, he stated that there are now about 240 species of Philippine Hymenoptera in the collection of the National Museum—probably not over three per cent of the species which will eventually be found in those islands.

Referring to the subject brought up by Dr. Ashmead of species of ants known only from one sex, Mr. Schwarz stated that in Cuba the winged forms of some species of ants are brought out in enormous numbers by the summer rains. Yet he has never, even after repeated attempts, been able to find the winged forms of *Dorymyrmex pyramicus* Roger, the "Lion ant" of the Cubans, which in that country plays the rôle of the Guatemalan kelep (*Ectatomma tuberculatum* Olivier) by protecting solitary cotton trees from the boll weevil (*Anthonomus grandis*). He had not found it possible to dig down to the real nest of *Dorymyrmex*. Mr. Barber stated that only in one instance had he seen ♀♀ of the common Texas harvesting ant (*Pogonomyrmex barbatus*). This occurred last summer on the stage road between Brownsville and Alice. The ground for an area of about 30 feet was densely covered with ♂♂ and ♀♀ scrambling over one another. The sight was a novel one, and attracted the attention of everyone on the stage.

—Dr. Dyar read a paper, by Mr. Currie and himself, entitled "The Egg and Young Larva of *Culex perturbans* Walker,"¹ after which, in discussing the possible habitat of the larva, Dr. Dyar mentioned a suggestion made to him by Dr. Howard, which seemed plausible, viz., that the larva may be found to live in bodies of stagnant water thickly covered with algæ—situations which have heretofore been considered unfitted for mosquito larvæ—and that its curiously constructed air tube may serve to penetrate the mass of vegetation, thus enabling it to secure air from the surface. He had not yet had an opportunity of testing the theory.

Dr. Hopkins stated that during the past summer he had discovered a number of mosquito eggs belonging to the genus *Megarhinus* on the surface of water in a rain barrel at Kanawha Station, West Virginia. Only one of the eggs hatched. The

¹ Published in Proc. Ent. Soc. Wash., VI, No. 4, pp. 218-220, 1 fig.; author's extras published November 4, 1904.

larva issuing from it was furnished with a live *Culex* larva about twice its size. The *Megarhinus* seized the *Culex* by the anal segment and gradually devoured it. It was then furnished with a *Culex* larva of still larger size and it found, upon grasping this larva as it did the first one, that it could not maintain its hold, but was shaken off. The *Megarhinus* thereupon changed its tactics and grasped the *Culex* by the prothoracic segment. This ruse was successful, for the *Culex* was then unable to free itself from the *Megarhinus* and was relentlessly devoured. All larvæ subsequently attacked by *Megarhinus* were seized by the prothorax regardless of their size. Dr. Hopkins stated that this was the only time he had found *Megarhinus* in West Virginia.

Mr. Schwarz said he believed it would be well to explore for mosquito larvæ pools whose water was covered with the iridescent film of oxide of iron. He thought it quite possible that interesting and peculiar larvæ might be found inhabiting such situations. He mentioned the location of a spring pool of this character near Plummer's Island, Maryland. Dr. Hopkins stated that he had found larvæ in film-covered pools in the neighborhood of coal mines. Dr. Dyar remarked that these were in all probability the larvæ of *Culex pipiens*. Dr. Hopkins questioned Mr. Barber as to whether *Megarhinus* adults were known to bite, Mr. Barber replying that he thought instances of their biting were known.

—Mr. Schwarz exhibited a box of the ears of the grass *Cenchrus echinatus* Linn., collected by him at Cayamas, Cuba, in May, 1904, with numerous specimens of large-sized insects captured by the spinous spicules of the grass. He has prepared the following abstract of his remarks:

THE INSECT-CATCHING GRASS OF CUBA.

BY E. A. SCHWARZ.

[*Author's Abstract.*]

Cenchrus echinatus Linn. is a widely distributed grass in tropical countries, both in the Old and New Worlds, but its insect-capturing capacity seems to have hitherto escaped the attention of botanists and entomologists alike. In the sugar-cane growing regions of central Cuba it occurs plentifully along the road-

sides between the sugar-cane fields, and at the commencement of the rainy season (end of April and first part of May), which is also the season of the swarming of a great number of insects, the ears of the grass are loaded with a multitude of large insects, mostly Coleoptera, captured by the spiny involucre of the spikelets of the grass. It is evident that the insects are captured while flying against the minutely barbed spines, and that almost always they are held fast by the hind wings, very rarely by some other part of the body. Among the numerous species found on the ears of the grass are some of the most powerful Coleoptera of Cuba, for instance, the well-known "Cucujos" (genus *Pyrophorus*) and the "Gallegos" (night-flying Scarabæid genera *Lachnosterna*, *Cyclocephala*, etc.), but none of them are ever able to free themselves from the death grip of the grass. The following list includes only those species which could be picked off the ears of the grass in thousands of specimens within half an hour's walk. Night-flying species: *Pyrophorus noctilucus*, *P. havaniensis*, *Monocrepidius bifoveatus*, *M. lividus*,¹ *Glyphonyx fuscus*, *Lachnopus curvipes*?², *Lachnosterna crenaticollis*, *L. patruelis*, *L. suturalis*, *L. dissimilis*, *Cyclocephala signata*. The day-flying Coleoptera are: *Cycloneda sanguinea*, *Thonalmus*, two or three species, *Exophthalmus scalaris*, *Anoplosiagon pallidum*.³ The Hymenoptera are represented by numerous specimens of *Apis mellifera*; the Diptera by *Mallophora orcina* (?), and the Neuropteroid insects by several species of Odonata. For reasons which I cannot explain, the Lepidoptera, Hemiptera, and Orthoptera were not represented among the insects thus captured. Very small insects, such as ants and small beetles of various families are able to walk with impunity over the barbs of the grass; and there are two large-sized species, viz., the grass-seed feeding earwig, *Apterygida linearis*, and a grass-seed sucking Pentatomid bug, *Ebalus pugnax*—both excessively common in Cuba during the rainy season—which are able to brave the dangers of the grass.

The rather extensive subject of insects caught by plants may be divided into the following topics:

¹ This and the preceding species as well as various other large-sized Elateridæ that are attracted by light are popularly called in Cuba "Cucujos ciegos," blind Cucujos, because they lack the luminous, eye-like thoracic spots.

² I experience some difficulty in the specific determination of this species. It is by far the most abundant, the most voracious and most polyphagous Otiorhynchid beetle in central Cuba. It is active both at day and night.

³ This little Scarabæid beetle flies about in countless numbers for an hour or so after sunrise, and in much smaller number just at sunset.

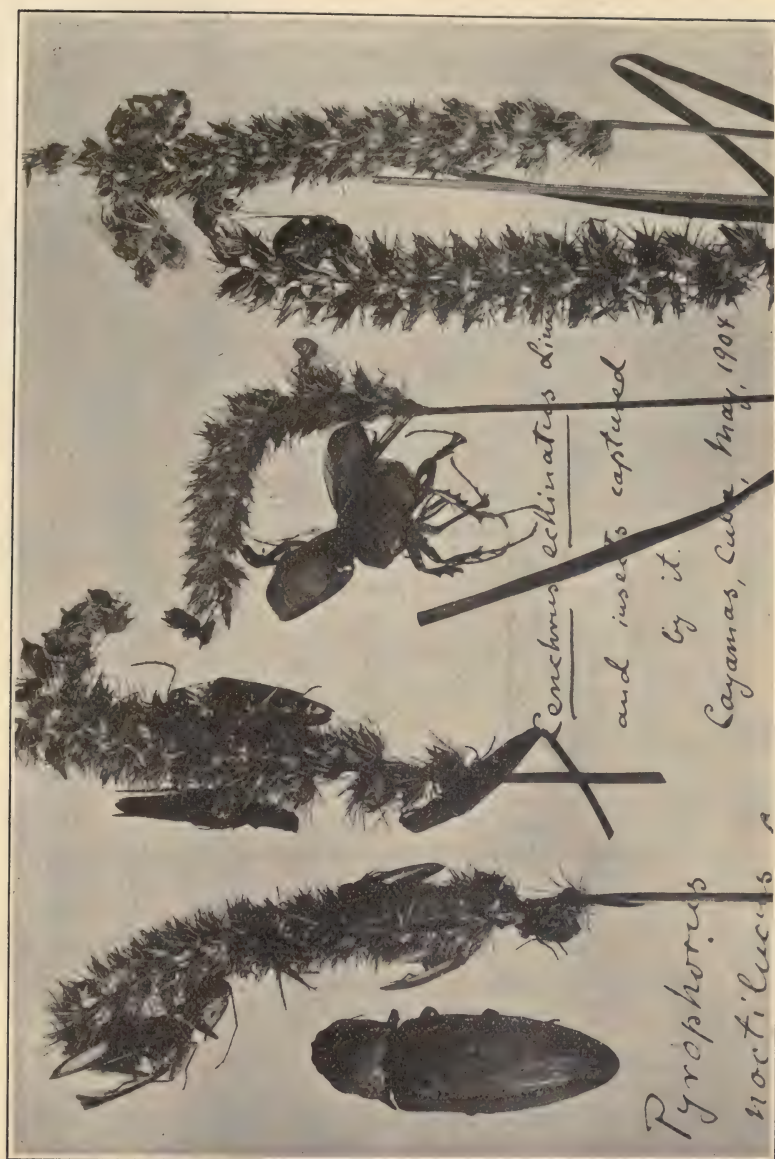


PLATE I.
THE INSECT-CATCHING GRASS OF CUBA.

A. *Insectivorous plants*, as exemplified by *Sarracenia*, *Darlingtonia*, *Drosera*, *Nepenthes*, *Utricularia*, and *Oenothera speciosa*. This phase of the subject has often been presented in print, both in the scientific and popular literature.

B. *Insect-catching, but not insect-devouring, plants, the plants deriving no conceivable benefit from the capture of the insects.* There are innumerable instances of this sort and the phenomenon is so common that, generally speaking, no particular attention has been given to it by entomologists, excepting in one case, viz., the insects preserved in amber or gum animé, concerning which quite an extensive literature has arisen. This whole phase of plants catching insects in an accidental or apparently accidental way may again be subdivided as follows:

1. *Plants capture insects by means of sticky surfaces or exudations, which may occur on the stems, leaves, flowers, or any other part of the plant.* In many instances these exudations have apparently no attraction to insects. In other instances sticky or gummy substances, exuding from wounds or other injury received by plants, attract and capture insects by the odor of the excretion—as exemplified by the resin of our coniferous trees. Finally, such exudations, when fermenting, possess intoxicating properties and attract and drown many, often large-sized, insects. Of this character are the exuding saps of oaks, birches, sugar maples, and other trees.

2. *Sharp blades of grasses capture insects.* This is a rare phenomenon, but is referred to both in the European and North American literature. Diurnal or crepuscular insects, mostly Coleoptera, while slowly flying about get caught by the grass in such way that the blade enters the angle formed by the bases of the fore and hind wings. The insects caught in this particular position are entirely unable to free themselves, and perish.

3. *Insects are caught by the hairy surfaces of plants.* This is also a common occurrence of a purely mechanical and accidental nature. Small and weak insects, usually Diptera, fly against the hairy stem or leaves of plants, e. g., our common mullein, and are unable to extricate themselves from the dense mass of hairs.

4. *Crepuscular or Nocturnal Lepidoptera caught by the tongue by the flowers of *Physianthus albens* and other asclepiadaceous plants.*

5. *Insects are caught by spinous plants, for instance, thistles and cacti.* These do not capture any insects except that in very rare instances a specimen gets impaled by flying against the spines. There is in Cuba a second species of *Cenchrus* just as spinous as *Cenchrus echinatus*, but the spines point upwards so that insects which happen to fly against the ears of the grass

can easily free themselves. In the case of *Cenchrus echinatus*, however, the spines or barbs along the involucre of the ripening seeds point downwards and form a perfect and infallible trap for any insect that flies against the ears of the grass.

In spite of the fact that even in a very small area untold thousands of insects are thus captured every night or day by this *Cenchrus echinatus*, there appears to be no ground for believing that the plant derives any benefit from their capture, and the phenomenon must be classed among the numerous instances of plants accidentally capturing and killing insects.¹

In discussion, Mr. Morris observed that an allied species of grass, *Cenchrus tribuloides*, the common sand burr, had been found by him along the shores of Lake Michigan in northwestern Indiana and northeastern Illinois with certain species of flies caught in its spines. Mr. Schwarz said that Elaterid beetles caught by the grass live for three or four days and then decay. He had never seen any insects caught by the sand burr in Florida.

The subject of insects impaled on thorns was then brought up, Mr. Schwarz maintaining that such cases are the work of shrikes and do not result from accident. Mr. Hay stated that he had found insects in central Indiana—mostly grasshoppers—impaled upon the barbs of barbed wire fences, and this in a region where shrikes are quite rare.

NOVEMBER 3, 1904.

The 190th regular meeting was held at the residence of Dr. H. G. Dyar, 1512 Twenty-first street N.W. Vice-President Banks presided, and there were present Messrs. Barber, Benton, Currie, Doolittle, Dyar, Gill, Hay, Heidemann, Hopkins, Morris, Patten, Piper, Ulke, and Webb, members, and Messrs. Charles B. Dyar and H. J. Nichols, visitors.

—Mr. Barber exhibited ♂ and ♀ specimens and larval skins of a rare Dermestid beetle, and furnished the following abstract of his remarks:

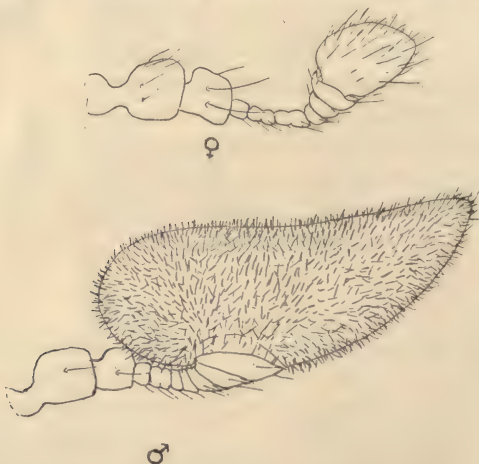
¹The preservation of the insects caught by the grass proved to be a difficult matter, and some of the finest examples of ears, notably one that had captured three specimens of *Pyrophorus noctilucus*, were lost, partly by the decay of the specimens and partly by the attacks of house ants. Those I brought to Washington were pinned in a box which was kindly photographed by Prof. A. A. Doolittle.

NOTE ON THAUMATOGLOSSA (AXINOCERUS) AMERICANA
JAYNE.

BY HERBERT S. BARBER.

[Author's Abstract.]

On April 24, 1904, I found on the bark of a hackberry tree, at Victoria, Texas, a mass of Mantid eggs about which were numerous specimens of a Chalcid (*Podagrion mantis* Ashm.), and thinking that I might breed other parasites, I took a chip of the bark with the mass on it and put it in a tin box. On looking at it a few days later I noticed several Dermestid larvæ which interested me, but as there was much else in the strange country around Brownsville to interest me I did not pay much attention to them. On June 10th the adults were alive, and on the 20th they were dead. Mr. Schwarz identified the species as *Thaumtoglossa* (*Axinocerus*) *americana* Jayne, of which he had previously taken two specimens in Lavaca Co., Texas, on the flow-

FIG. 1.—*Thaumtoglossa* (*Axinocerus*) *americana* Jayne:

♂ and ♀ antennæ.

ers of *Bumelia lanuginosa* (one, the type, is now in the LeConte collection). A third specimen, which he took in the gall of a Coccid (*Olliffiella cristicola* Ckll.) on oak (*Quercus oblongifolia*) in the Santa Rita mountains, southern Arizona, is much larger and may represent another species of the genus. I bred sixteen specimens in all, four of which are males. The accompanying figure (fig. 1) illustrates the antennæ of both sexes.

—Mr. Heidemann exhibited specimens and presented the following description of a new hemipteron belonging to the genus *Anasa*:

DESCRIPTION OF A NEW *ANASA* FROM NORTH AMERICA.

BY OTTO HEIDEMANN.

Anasa repetita, new species.

Elongate-oval, uniformly brown or light brown. Upper surface of body, and breast, with irregular rows of dark punctures; from each puncture arises a short, stiff, golden bristle; abdomen transversely wrinkled, the punctures somewhat obsolete, with finer and longer hairs which are more closely placed on the apex of abdomen. Head without a spine or tubercle near the antennæ; ocelli amber-colored, blackish-edged behind; antennæ moderately long and finely pilose; basal joint one-third longer than the head, gradually curved, brown, with a black line exteriorly and a few black dots; the black line even reaching the antenniferous tubercle; second joint a little longer than the first; the third nearly equal in length with the second, both joints about half as thick as the basal joint, black, narrowly yellowish-white at base; terminal joint shorter, fusiform and orange-colored. Rostrum reaching the middle coxæ, light brown, black at tip. Thorax broader than long; the disk feebly convex, in the middle a longitudinal narrow, smooth whitish line; lateral margins slightly sinuate anteriorly, and obtusely rounded posteriorly near the humeri; the anterior margin less than half as broad as the posterior; the latter considerably depressed and straight, the transverse raised line above the margin well defined. Scutellum wrinkled; at the basal corners a triangular, black spot and also one at the tip. The disk of the corium has a few dark speckles, formed by the more or less confluent punctures. The membrane brownish and sprinkled with some large, black dots, the base darker. The connexivum is edged with white and black lines and has on the incisures broad, whitish, transverse bands. Abdomen much rounded, luteous, on the sides of the segments a few black spots; also one or two near the base of the coxæ. Feet yellowish white and dotted with large, black spots.

The genital segment of the ♂ is quite remarkable: it is a little longer than broad, with a transverse, shallow line before the middle, the base convexly rounded and sloping abruptly towards the apex, which is truncate, very feebly indented in the middle, with the corners decidedly hump-like in form.

Length, ♀ 15 mm., ♂ 12 mm.; width across the thorax, ♀ 6 mm., ♂ 5 mm.

Four specimens, ♂♂ and ♀♀, Washington, D. C., September 6, 1903; Glen Echo, Md., July 10, August 25, 1893 (Heidemann).

Type.—No. 8217, U. S. National Museum.

This species very much resembles *A. armigera* Say in form and colors, but can easily be distinguished by the absence of the spines on the head and by the differently-shaped ♂ genitalia. It differs from the common squash bug (*A. tristis* De Geer) in having a comparatively shorter and broader thorax and in lacking the stripes on the head. The species is referred to by Dr. F. H. Chittenden, in an article on the life history of the horned squash bug, published in Bulletin 19, new series, U. S. Department of Agriculture, p. 30, 1899.

—Mr. Caudell said that he had just returned from Cambridge, Mass., where he spent several weeks in the study of Scudder's types of North American Orthoptera in the Museum of Comparative Zoology. He stated that the Scudder collection is now well cared for by the curator of the Museum, Mr. Samuel Henshaw, although it is obvious that during the prolonged illness of Dr. Scudder it had suffered from neglect. With the exception of those groups lately revised by Scudder, the collection is not as well arranged as might have been expected. Mr. Caudell mentioned short visits he had made, before his return to Washington, to museums in New York, Brooklyn, and Philadelphia. At Wellesley, Mass., also, he had visited Dr. A. P. Morse, and had had the opportunity of examining his collection of Acrididæ—undoubtedly one of the finest collections in this family in the United States.

—Mr. Benton reported that he had seen a comb of the giant honey bee (either *Megapis dorsata* or *M. zonata*) in the Philippine exhibit at the World's Fair, St. Louis, Mo. It was attached to the under side of the limb of a tree and measured about 1½ feet in width by some 3 feet in length. There were 4½ cells to the linear inch, or 20 to the square inch, while the thickness of the comb where brood had been reared was 1 7-16 inches. Mr. Benton stated that the workers of the giant bees are about as large as queens of *Apis mellifera*.

—Mr. Banks showed a collection of several species of Hymenoptera whose sleeping habits he had observed. During last summer he discovered a colony at Falls Church, Virginia, about a mile distant from the one found by him two years ago.¹ The

¹ Sleeping Habits of Certain Hymenoptera. By Nathan Banks. Journ. N. Y. Ent. Soc., x, No. 4, pp. 209-214, December, 1902.

colony, or sleeping place, was tenanted by some eight or ten different species. Although he noticed a few ♀♀, most of the specimens observed were ♂♂. Small bees were found in closed blossoms of the lace flower, or wild carrot (*Daucus carota*), while bumble bees rested under the edges of certain flowers. Wasps belonging to the genus *Ammophila* held on to grass stems by their mandibles, the body extended straight and wings closely folded. Some other species use their mandibles in the same way, but *Ammophila* is the only insect which, in some cases, uses its mandibles exclusively for this purpose, the legs not touching the stem.

—Mr. Banks referred to his recent visit to the Museum of Comparative Zoology at Cambridge, Mass., where he made an examination of Hagen's collection of Neuropteroid insects and Emerton's collection of spiders. Some of Keyserling's types of spiders, also, are deposited in the Museum. He stated that Hagen's collection has not been rearranged but is kept intact just as Hagen left it. This Mr. Banks considered most commendable and a policy which should be more generally followed.

—Mr. Caudell mentioned instances which have come under his observation of the mating of different species of *Melanoplus*, *Schistocerca*, and other Orthoptera. The Morse collection of Acrididæ, he stated, contains a fine series of intergrades. The subject of hybridization was discussed by Messrs. Piper and Gill, the latter stating that so-called new genera in fishes have been based upon hybrids between different genera.

—Dr. Dyar read the following paper:

OUR PRESENT KNOWLEDGE OF NORTH AMERICAN
CORETHRID LARVÆ.

BY HARRISON G. DYAR.

Having discussed, in conversation with Mr. Coquillett, the relationships of the Diptera allied to the Culicidæ, it seemed to us a more natural arrangement to separate the true mosquitoes into a distinct family on the character of the presence of the proboscis, and remove the non-biting forms, the old Corethrinæ, placing them with the Dixidæ as a second family, under the name Corethridæ. In the larvæ of this group the mouth brushes are somewhat developed, and in other characters they approach the true mosquitoes.

Dixa is the most generalized form and is a surface feeder, taking small vegetable particles by the rapid motion of its mouth parts. The air tube is well developed, but sessile, and there are false abdominal feet to assist the larva in ascending the water film at the margin, as is its habit. From *Dixa* can be derived not only all the other Corethridæ, but the Culicidæ as well. *Anopheles*, for example, is very close to *Dixa* in many characters.

Except *Dixa*, all the Corethridæ are predaceous, feeding largely on the larvæ of the true mosquitoes. Next to *Dixa* comes *Eucorethra*, with its air tube still sessile, but the mouth parts modified for its predaceous habits. It is still nearly a surface feeder, lying flatly in the water. *Corethrella* is a fur-

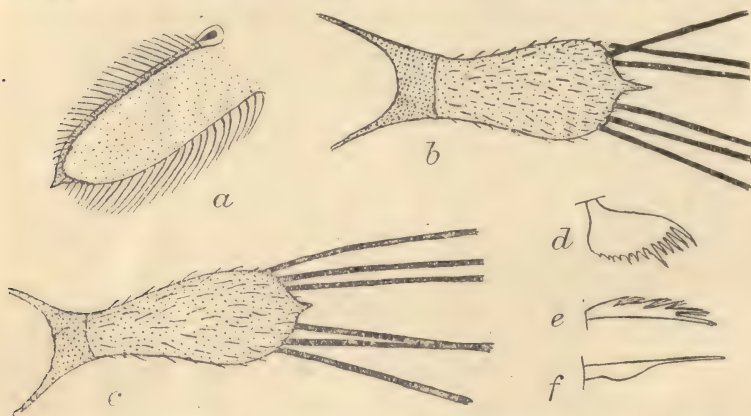


FIG. 2.—Structural details of North American Corethrid larvæ: *a*, ciliated plate of air tube in *Dixa recens*; *b*, anal segment of *Dixa recens*; *c*, the same of *D. centralis*; *d*, leaf-like appendage of *Sayomyia americana*; *e*, the same of *S. trivittata*; *f*, the same of *S. knabi*

ther specialization of this type, the air tube having become elongated, allowing the larva to sink lower in the water, while the peculiar rapacious antennæ are remarkably adapted.

Corethra shows a development in a different direction. The air tube is elongated, but apparently could not be adapted to the requirements of the larva, as it became necessary for it to sink deeper and deeper in the water, so it has begun to be dis-used. The horizontal position is still maintained by the formation of air bladders, one pair in the thorax, a second near the end of the abdomen. These are enlargements of the tracheal tubes and are joined by them to the air tube. It would seem that this fortunate arrangement supplied the larva with air-reservoirs, so that it is able to stay long below the surface and frequent the depths where it finds its subsistence.

Sayomyia has accomplished a still further specialization along these lines. It has dispensed with the air tube entirely and the trunks of the tracheal tubes as well, while it floats like a transparent ghost deep in the pool, carrying its four sacs of air which are now never connected with the air above. We suppose that the air in these sacs is replenished by diffusion through the body walls from the air dissolved in the water; but the character appears to us as a very remarkable one which would not have been antecedently thought possible.

The Corethridæ, as here limited, include 23 species described from North America. Of these we know the larvæ of 15 more or less completely. There are no unknown genera, and it is probable that the unknown species of *Dixa* and *Sayomyia* are similar to the known ones. Indeed some of the species of *Dixa* may be synonymous; but on the other hand, there are probably a number of forms to be discovered. The subject has been very little worked.

The following synoptic table will separate the known larvæ:

1. Air tube present.....	2
Air tube absent, larvæ aquatic.....	7
2. Air tube sessile, larvæ at surface of water.....	3
Air tube elongate, larvæ below surface of water.....	6
3. Abdomen with false feet; antennæ not longer than other mouth parts	4
Abdomen without false feet; antennæ long and directed forward	
	<i>Eucorethra underwoodi</i>
4. Ciliated plates of the air tube without a projecting triangular hairless apex.....	<i>Dixa clavula</i> ¹
These plates with such an apex (fig. 2, a).....	5
5. Anal segment finely haired, the hairs shorter than the stout terminal cone (fig. 2, b).....	<i>Dixa recens</i>
Anal segment coarsely haired, the hairs longer than the small terminal cone (fig. 2, c).....	<i>Dixa centralis</i>
6. Antennæ moving in a horizontal plane; larvæ flattened dorso-ventrally.....	<i>Corethrella brakeleyi</i>
Antennæ moving in a vertical plane; larvæ subcylindrical,	
	{ <i>Corethra cinctipes</i> ²
	{ <i>Corethra lintneri</i>
	{ <i>Corethra velutina</i>
	{ <i>Corethra karnerensis</i>

¹ = *modesta* Joh. According to Mr. Johannsen's figure (Bull. 68, N. Y. State Mus., pl. 48, figs. 5 and 7, 1903). I have not myself seen the larva. The projecting apex belongs to the outer sheath of the plate and it may not be shown in Johannsen's figure.

² I am unable to distinguish *Corethra cinctipes* Coq. and *C. velutina* Ruthe. The latter may not be the European form, but *C. karnerensis* Felt or *C. lintneri* Felt, which I am likewise unable to distinguish.

comprises 132 specimens, representing 16 species. In addition there are five specimens from Vancouver Island collected by Dr. Dyar, representing four species not included in those from the Kootenay country, namely, *Lestes congener*, *Æschna contracta*, *Sympetrum costiferum* and *S. vicinum*.

While at Banff, Alberta, the writer took an undetermined ♀ of *Æschna*; and Mr. N. B. Sanson, Curator of the Park Museum at Banff, subsequently sent him for determination three specimens of *Sympetrum scoticum*, a species which in all probability occurs in portions of British Columbia.

The most abundant species in the Kootenay District appear to be *Lestes forcipatus*, *Enallagma cyathigerum*, *Cordulia shurtleffi*, *Leucorhinia proxima*, *Sympetrum corruptum* and *Libellula quadrimaculata*.

The writer is indebted to Dr. Philip P. Calvert for kind assistance in naming some of the species of *Sympetrum* and for verifying the determinations of *Leucorhinia*.

[*Lestes congener* Hagen.]

We did not find this species in the Kootenay District, but Dr. Dyar collected a single ♂ at Wellington, on Vancouver Island, September 2.]

Lestes uncatus Kirby.

Kaslo, August 5 (1 ♂, 1 ♀), August 7 (1 ♀).

Lestes forcipatus Rambur.

Kaslo, July 9 (3 ♂♂, 6 ♀♀)—all somewhat teneral; Mirror Lake, Kaslo, August 6 (1 ♀).

One of the ♂♂ is remarkable for its extremely short abdomen—measuring only 20.5 mm., the same length as the hind wing.

Enallagma yathigerum Charpentier.

"Lilypad Lake," Kaslo, June 7 (Dyar: 2 ♂♂, teneral); June 10 (5 ♂♂, 2 of them teneral), June 26 (2 ♂♂), July 2 (3 ♂♂, 2 of them teneral), July 9 (5 ♂♂); Mirror Lake, Kaslo, August 6 (3 ♂♂, 1 pair *in coitu*); Loon Lake, Ainsworth, July 11 (1 ♂); Bear Lake, July 20 (5 ♂♂).

Enallagma sp.

"Lilypad Lake," Kaslo, May 29 (Dyar: 1 ♀); Mirror Lake, Kaslo, July 7 (1 ♀), August 6 (2 ♀♀); Loon Lake, Ainsworth, July 11 (1 ♀).

These specimens belong either to *cyathigerum* or *calverti*, but as no character for separating the ♀♀ of these two species has yet been discovered they cannot now be determined specifically.

Enallagma calverti Morse.

Mirror Lake, Kaslo, August 6 (3 ♂♂); Loon Lake, Ainsworth, July 11 (1 ♂, 1 pair *in coitu*).

Enallagma carunculatum Morse.

Mirror Lake, Kaslo, July 17 (1 ♀), August 6 (6 ♂♂, 1 pair *in coitu*, 1 ♀).

Ischnura cervula Selys.

Mirror Lake, Kaslo, July 17 (1 ♂), August 6 (1 ♂).

Æschna juncea (Linnæus).

Kaslo, August 7 (1 ♂).

Æschna multicolor Hagen.

Loon Lake, Ainsworth, July 11 (2 ♂♂).

[Æschna constricta Say.

Not taken in the Kootenay District, but Dr. Dyar collected two ♂ specimens on Vancouver Island—one at Shawnigan Lake, August 31, and the other at Wellington, September 2.]

Æschna spp.

"Lilypad Lake," Kaslo, July 8 (1 ♀); Bear Lake, July 21 (1 ♀); South Fork Creek, August 11 (1 ♀).

Also a ♀ from Banff, Alberta, collected on August 16.

Somatochlora semicircularis (Selys).

Loon Lake, Ainsworth, July 11 (1 ♂); Bear Lake, July 20 (1 ♀).

The triangle is crossed in the left hind wing of the ♂ and in both hind wings of the ♀. The triangles are crossed in the fore wings of both specimens, but there is in the U. S. National Museum a specimen collected by the writer on the Snake River, Yellowstone National Park, August 14, 1896, in which the triangles of both fore wings are free, although the cross-vein is indicated at either end in the right wing.

Cordulia shurtleffi Scudder.

"Lilypad Lake," Kaslo, May 29 (Dyar: 1 ♂), June 7 (Dyar: 1 ♀), June 10 (3 ♂♂); Loon Lake, Ainsworth, July 11 (17 ♂♂).

Five of these specimens show irregularities in venation, as follows: The single ♀ has a *second* cubito-anal cross-vein in the right hind wing; while of the other specimens—♂♂, all from Loon Lake—one has a second cubito-anal cross-vein in the *right* hind wing; one has this vein, interrupted in the middle, in the *left* hind wing; one has this vein in *both* hind wings; while the fourth specimen has *no* cubito-anal cross-vein in *either* hind

wing, although the first cross vein is indicated at the upper and lower extremities of the median space.

Leucorhinia hudsonica (Selys).

"Lilypad Lake," Kaslo, June 7 (Dyar: 1 ♀); Fletcher's Ranch, Kaslo, 2,800 feet alt., June 11 (1 ♂); Ainsworth, June 8 (Dyar: 1 ♂, 1 ♀).

The triangle of fore wings is crossed in all four of our specimens. The postcubitals vary from 7 to 10. The internal triangle, in the ♂ collected on June 11, is 3-celled in right fore wing, partially crossed by a single vein in the left fore wing; in the ♂ from Ainsworth the internal triangles are 2-celled in both fore wings; in the ♀ collected on June 7 the internal triangle in right fore wing is 3-celled, in left fore wing open, the triangle of left hind wing is crossed and there is one supratrangular on the right hind wing; in the ♀ from Ainsworth the internal triangle is 2-celled in left fore wing, free in right fore wing.

Leucorhinia proxima Calvert.

"Lilypad Lake," Kaslo, June 1 (Dyar: 1 teneral ♂), June 10 (1 ♂); Kaslo, June 12, found dead on hotel window (1 ♂), June 26 (1 ♂), July 2 (1 ♀), July 9 (1 ♂).

The specimen collected on June 1 has the wings subfumose.

Sympetrum corruptum (Hagen).

Kaslo, June 7 (Dyar: 1 ♀), June 13 (1 ♀), June 18 (3 ♂♂), June 19 (2 ♂♂, 2 ♀♀), June 23 (1 ♀), June 26 (2 ♂♂, 1 ♀), June 28 (1 ♂), June 29 (3 ♂♂), July 2 (4 ♀♀); Fletcher's Ranch, Kaslo, 2,800 feet, June 11 (1 ♂); Loon Lake, Ainsworth, July 11 (1 ♂).

Sympetrum madidum (Hagen).

Kaslo, August 5 (1 ♀).

The single specimen seems to be referable to this species rather than to any other of the described North American species of *Sympetrum*.

Sympetrum obtrusum (Hagen).

Kaslo, August 7 (2 ♀♀).

The writer had determined these specimens, from the description, as Hagen's *decisum*; but Dr. Calvert has since informed him that some years ago, from a study of Hagen's types of that species, he reached the conclusion that *decisum* is a synonym of *obtrusum*.

[**Sympetrum vicinum** (Hagen).

Wellington, September 2 (Dyar: 1 ♂).]

Sympetrum semicinctum (Say).

Kaslo, August 6 (1 ♀), August 7 (1 ♂).

[Sympetrum costiferum (Uhler).

Wellington, September 2 (Dyar: 1 ♀).]

[Sympetrum scoticum (Donovan).

Banff, Alberta (N. B. Sanson: 1 teneral ♂, 1 adult ♂, 1 ♀).]

Libellula quadrimaculata Linnæus.

Kaslo, May 29 (Dyar: 1 ♀), June 9 (1 ♂), June 11, Mirror Lake, 1,670 feet, and Fletcher's Ranch, 2,800 feet (21 ♂♂, 5 ♀♀, 2 pairs *in coitu*), June 14 (2 ♂♂), June 16 (1 ♀), June 18 (1 ♂, 1 ♀), July 2 (1 ♂).

—The concluding paper was by Mr. Banks, and entitled:

ARACHNIDS FROM COCOS ISLAND.

BY NATHAN BANKS.

Cocos Island, situated in the Pacific Ocean some distance off the west coast of Mexico, has been rarely visited by naturalists. The only spider previously recorded from the island is *Argyraepeira nigriventris* Keys., which was taken by the Hopkins-Stanford Galapagos Expedition. A few years ago Dr. Paul Biolley of San José, Costa Rica, visited the island, and several papers have been published on the results of his trip. The Arachnida were sent to me for examination, and although few contain one or two interesting things. The most important is a Phalangid representing a new genus. There were eight species in the collection, six spiders, and two Phalangids. The types are in the collection of the writer.

ARANEIDA.**Gasteracantha hexacantha** Fabricius.

Several specimens of the usual type. This is a widely distributed species in the tropics.

Gasteracantha biolleyi, new species.

Cephalothorax black; legs and sternum black; abdomen yellow, with black spines and marks; a band connecting the larger lateral spines, an oblong spot near base of anterior spines, and a crescent each side in front; from the black band there is a mark extending to the posterior spines; all the sigillæ are on these black marks. The venter is black, with many small yellowish spots. In shape it is much like *G. cancriformis*,

but the posterior lateral spines are larger and more recurved than in that species.



FIG. 3.—*Gasteracantha biolleyi*.

Two specimens from Cocos Island collected by Dr. Paul Biolley.

***Leucauge argyra* Walckenær.**

A few specimens of this common tropical spider.

***Leucauge nigriventris* Keyserling.**

Taken by the Hopkins-Stanford Galapagos Expedition. It occurs also in northern South America and in the Galapagos Islands.

***Theridium* species.**

A few specimens of a small species, with a short yellow abdomen and a black cephalothorax. Quite possibly it is new.

***Ctenus* species.**

One immature specimen.

***Lycosa* species.**

Several young specimens.

PHALANGIDA.

***Pellobunus*, new genus.**

Near *Sterrhosoma* Thorell, but separated therefrom by the slender legs, with fewer tarsal joints, and fewer spines on tibia of palpus, and by absence of claw to tarsus I.

Type: the following species:

***Pellobunus insularis*, new species.**

Body and mandibles reddish; palpi and legs yellowish; the latter banded with black on patellæ, tibiæ, and metatarsi; one at apex of femur, one at apex of patella, three on tibia (one at base, one beyond middle, and one at the tip), two on metatarsus (one near base, and one near the tip); sometimes, also, bands on tarsi. Two ocelli separated by a broad, rounded tubercle; mandibles large, but not greatly swollen. Legs all slender, with

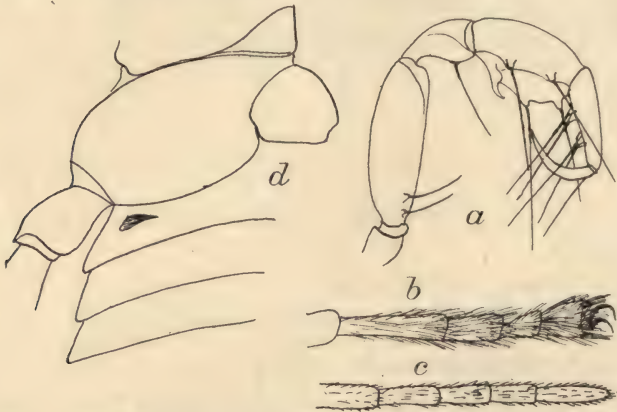


FIG. 4.—*Pellobunus insularis*: *a*, palpus; *b*, tarsus III; *c*, tarsus I; *d*, coxa IV and base of abdomen.

rows of short bristles; no claw to leg I; tarsus I with 5 joints; II with 6 joints; III and IV with 4 joints each. Palpus rather slender, two spines, or rather tubercles tipped with bristles, on each lower edge, and a hook at base on outer edge; two similar bristles on each lower edge of metatarsus, the apical claw nearly as long as last joint. Abdomen with last four segments free; the dorsum with many transverse rows of short curved bristles; similar bristles on the venter. Length 3 mm.

One specimen from Cocos Island, collected by Dr. Paul Biolley.

***Cynorta insularis*, new species.**

Body rich red-brown, a yellow spot each side over coxæ II, four pairs of small spots in diverging rows from eyes to posterior margin of dorsal shield, and a larger yellowish spot at each outer apical corner of dorsal shield; legs and palpi yellowish. Basal joint of mandibles roughened above, and tuberculate on outer sides; eye-tubercle broad, low, and smooth; two erect, acute, submedian spines behind on the edge of dorsal shield; dorsal seg-

ments with a transverse row of granules on middle, ventral segments with row near posterior margin; coxæ strongly and evenly granulate; legs with rows of minute, erect bristles; tarsus I of 6 joints, the basal twice as long



FIG. 5.—Palpus of *Cynorta insularis*.

as others; tarsus II of 13 joints, the basal scarcely as long as next two together; tarsus III of 6 joints, basal as long as next two together; tarsus IV of 9 joints, basal nearly as long as next three together. Length 4.5 mm.

Two specimens from Cocos Island, collected by Dr. Paul Biolley. This species is related to *C. quadripustulata*, but without the large spots, of smaller size, etc.

DECEMBER 1, 1904.

The 191st regular meeting was held at the residence of Mr. Otto Heidemann, 700 Newark street, N.W., Vice-President Hopkins in the chair, and Messrs. Ashmead, Barber, Benton, Burke, Currie, Dyar, Heidemann, Morris, Piper, Quaintance, Schwarz, Scott, and Titus, members, and Messrs. Couden, Girault and Strauss, visitors, present.

The following new members were elected: Corresponding members, Dr. W. E. Britton, Entomologist of the Connecticut Agricultural Experiment Station, New Haven, Ct., and Messrs. W. J. Phillips and G. I. Reeves, of Urbana, Ill. Active members, Messrs. F. D. Couden and A. A. Girault, of the Bureau of Entomology, U. S. Department of Agriculture.

Officers for the year 1905 were elected as follows: President, Mr. Nathan Banks; First Vice-President, Dr. A. D. Hopkins; Second Vice-President, Mr. Otto Heidemann; Recording Secretary, Mr. Rolla P. Currie; Corresponding Secretary, Mr. Frank Benton; Treasurer, Mr. J. D. Patten; additional members of the Executive Committee: Dr. H. G. Dyar, Dr. L. O. Howard and Mr. C. L. Marlatt.

—Mr. Schwarz exhibited specimens of a Ptinid beetle (*Nip-tus hololeucus* Faldermann) received from Prof. James Fletcher, Entomologist of the Canadian Government, who reported that it was a great nuisance in houses in Montreal. He stated that some years ago¹ he had published the prediction that the importation into America of this omnivorous beetle was only a question of time. He reviewed the literature on the beetle in reference to its distribution and economic importance.

—Dr. Ashmead announced that the National Museum had received from Father Robert Brown of Manila some Philippine fig-insects (Agaonidæ)—the first fig-insects to be recorded from the Philippine Islands. They fall in the Australian genus *Kradibia*. With them were specimens of the inquilinous or parasitic Idarnines belonging to the genus *Sycoryctes*, first described from Java.

—Dr. Ashmead stated, further, that in a collection of insects from Mr. Charles S. Banks, the Entomologist of the Philippines, were specimens of Hymenoptera belonging to *Oxybelus* and *Prosopis*—two genera not before on record from the Philippine Islands. Another addition to the list of Philippine Hymenoptera from the same source is the nearly cosmopolitan ant *Solenopsis geminata* Fabr.

—Dr. Hopkins exhibited a branch of juniper from Vermijo, New Mexico, showing the work of a new Scolytid beetle belonging to the genus *Phlæosinus*. The tree, from which the branch was cut on May 6, 1903, was felled during the summer of 1902. Live beetles were noticed on the branch on July 24 of the present year, and now, one year and seven months after the branch was collected, some of the beetles are still alive and running about.

—Mr. Heidemann showed specimens of Hemiptera belonging to the genus *Homalocoris*, and probably representing the Mexican species *guttatus* of Walker, collected at Flagstaff, Arizona, during the past season by Mr. Webb. There are now in the National Museum collection ten specimens from Arizona of this interesting species. The first of these were found by Mr. H. G. Hubbard in the Chiricahua Mountains; later it was collected by Mr.

¹ Can. Ent., xxviii, p. 178, 1896.

Schwarz in the Santa Rita Mountains, and still later by Messrs. Schwarz and Barber at Williams. Lastly it has been found by Mr. Webb, as above stated. Mr. Heidemann added that *Homolocoris* and another genus, *Hammatocerus*, form a distinct subfamily of the Reduviidæ known as the Hammatocerinæ. This is the only species of *Homolocoris* which has been reported north of the Mexican boundary.

—Mr. Barber exhibited an original photograph of a wasp nest from Brownsville, Texas, made by the Vespid *Gaba* (*Nectarina*) *mellifica* Say. He was told by the negro who had possession of the nest that these wasps produce a palatable honey and that it is customary for the Mexicans to secure the nests when small and keep them until of full size, then destroying the wasps and extracting the honey. The nest was similar to those of our common paper-making wasp, *Vespa maculata*, except that in its lower portion the cells were exposed. It was globular in shape and about nine inches in diameter—not of full size, according to the negro, who, after cautiously inserting a knife into it, withdrawing it and examining the blade, asserted that there was yet too little honey contents to make it worth while to open it up. Mr. Barber said he tried to taste the honey, but the amount on the knife blade was so small that he could scarcely detect any flavor. Thomas Say,¹ in the paragraph following his original description, says of this species that near Jalapa, Mexico, his attention was attracted by a group of Indians eating honey from a paper nest. He found that the honey had a pleasant taste and inferred from the gestures of the Indians that the nest was obtained from a tree.

Mr. Ashmead remarked that it was of interest, in this connection, to note that another Vespoid wasp (*Celonites abbreviatus* Villers, of the family Masaridæ), coming from Algiers, is said to be a honey-maker. Mr. Benton expressed some doubt as to whether the substance produced by the wasps is real honey, but thought it might consist of brood food accumulated in the cells. Mr. Titus stated that he had received from Trinidad, from Mr. H. D. Chipman, a Vespid from which honey is said to be obtained.

¹ LeConte's Edition, Vol. II, p. 769.

—Mr. Schwarz reported that on his recent visit to Texas he learned that the sweet-potato beetle (*Cylas formicarius* Fabricius) had been found in great numbers along the coast of Texas. This beetle came originally from Madagascar and has become introduced into tropical and subtropical portions of the western hemisphere. For some time past it has been known from Florida and Louisiana, but its discovery in Texas indicates that it is now to be found throughout the Gulf region from Florida to Texas and Mexico. Mr. Schwarz stated that he had found it particularly abundant in Cuba, but not so injurious there as elsewhere, since the common variety of sweet potato in that country has run wild and is a troublesome weed, the luxuriant vines overgrowing everything. The beetle is known to Cubans by the name "Tetuan," tradition having it that it first invaded Cuba in the same month and the same year when the famous battle of Tetuan was fought by the Spanish army against the Sultan of Morocco, February 4, 1860.

Mr. Currie said that he had found another species of the genus very destructive to sweet potatoes in Liberia, West Africa, and Mr. Schwarz added that the Liberian species is probably *Cylas turcipennis* Boheman, originally described from Java. He said that there are about ten species known in the genus, all of them coming originally from tropical Africa or the Malay Archipelago.

—Dr. Hopkins stated that while investigating insect damage to hickory trees at Clark's Station, Missouri, on July 10, 1904, he found seven or eight small larvæ attached to a Cerambycid larva (*Neoclytus luscus*) in the sapwood of a hickory tree killed by *Scolytus 4-spinosus*. The larvæ were decidedly parasitic, and were supposed at the time to be braconid, but when (on July 20) they had completed the destruction of their host, and formed peculiar flattened cocoons, he recognized the cocoons as those of a beetle which he had often observed in the larval mines and pupal cases of Cerambycid larvæ, and while at the West Virginia Station he had bred an adult. As near as he could remember, the bred beetle is a Colydiid, probably identical with *Bothrideres contractus*. He says that there is no question regarding this larva being a true external parasite, as much so, indeed, as a braconid. A microscopic examination of the

cocoons shows that the ventral portion by which it is attached is composed of silk-like threads woven in a similar manner to that of hymenopterous cocoons. The dorsal covering is less silk-like, and quite brittle. Mr. Schwarz remarked that a species of *Bothrideres* has been recorded by Mr. Coquerel, in one of the earlier volumes of the *Ann. Soc. Ent. de France*, as a parasite of a Cerambycid larva; and that another species, *Bothrideres cactophagi* Schwarz, had been recorded by Mr. H. G. Hubbard (in *Psyche*, vol. VIII, Suppl. I) as a parasite of the larva of a large Calandrid beetle, *Cactophagus validus* Lec.

—Mr. Benton read the following communication by Mr. G. W. Kirkaldy, extracted from a letter addressed to him as Corresponding Secretary of the Society:

THE HISTORICAL METHOD IN TYPE-FIXATION.

BY G. W. KIRKALDY.

In the discussion on "Type-fixation" in a recent number of the Proceedings of this Society no mention is made of the "Historical" method, and as the writer has noticed that this method has been quite ignored in several recent discussions, for example, in the "*Zoologischer Anzeiger*," he will briefly outline it.

By this method—which has been adopted in the writer's forthcoming "*List of the Genera of the Hemiptera*," and which is also adopted by Mr. Prout, the well known English lepidopterist, who is patiently investigating the nomenclature of the Geometræ—each genus is treated absolutely independently; each is taken separately and the various applications of later authors, their restrictions and type fixations, considered without reference to other genera at all.

Take, for example, the genera *Neides* and *Berytus*. *Neides* Latreille was erected in 1802, for two species, *tipularius* and *clavipes*; a year later, Fabricius founded *Berytus* with *tipularius* specified as type. In this case the "Eliminators" would probably admit two genera, as follows:

1. *Berytus*, with *tipularius*, and—
2. *Neides*, with the species remaining, viz., *clavipes*; and this is in fact the view taken by Lethierry and Severin.

The "historical" method would be as follows:

1. *Berytus*, 1803, type *tipularius*, 1803;
2. *Neides*, 1802, no type till 1804, when *tipularius* was fixed.

In the writer's papers on the bibliography of the genera of the Hemiptera in "The Entomologist"¹ he considered that *Berytus* and *Neides* were strictly homotypical and that *clavipes* required a new generic name; as follows:

1. *Neides* Latreille, 1802, type *tipularius*, 1804;

Berytus Fabricius, 1803, type *tipularius*, 1803;

2. *Berytinus* Kirkaldy, 1900, type *clavipes*, 1900.

There is, in the opinion of the writer, no doubt that in 1802 to 1804 only one genus would be recognized for these two forms, and indeed Latreille in 1804 so considered it. *Clavipes* was not, he believes, treated as generically distinct till about 25 years later when the same author (Schilling) used *Berytus* for the one and *Neides* for the other.

With rule No. 1 of Rothschild and Jordan, the writer cordially agrees and indeed has acted upon the principle from the commencement of his studies. But No. 2 will, he hopes, not be recognized at all. It is at least contrary to the usual procedure of monographers of to-day. It must be noted, however, that certain of the older authors held to this rule; for example, Westwood, in 1839,² writes:

"The reader will observe that I do not here insist upon the necessity of placing a typical species at the head of the genus, because even our imperfect views of nature will enable us to see that such species ought often more naturally to be placed in company with others not arranged at the head of the genus, but I do insist that, where an author does not state the particular species which he regards as the type of his genus, we are bound to suppose that he would place it at the head of his genus."

Though this statement in no way affects the types of other authors, the writer believes that in all Westwoodian genera dating from 1839, the first species must be taken as the type, if this be not otherwise specified.

The paper evoked discussion from Messrs. Ashmead, Morris, Dyar, Piper and Schwarz, Dr. Dyar favoring the method which accepts the first species as type, while the others believed the method of elimination, although leading to unsatisfactory results in certain cases, yet the one which is now most generally

¹ Vol. xxxiii, pp. 238-243, 1900; Vol. xxxvii, pp. 254-258, 1904.

² Mag. Nat. Hist., 1 (2), p. 170. I was previously aware of this in a paper of Westwood's dated 1841, but for the date 1839, I am indebted to Mr. Prout.

followed and the only one which does justice to the authors of subsequently-erected genera.

—The following paper by Dr. Dyar was read by title:

NEW NORTH AMERICAN LEPIDOPTERA AND SYNONYMICAL NOTES.

BY HARRISON G. DYAR.

The following paper is in large part the result of a study of a collection of some 1,500 specimens of Phycitinae which Mr. W. D. Kearfott has placed at my disposal.

Family NOCTUIDÆ.

Tæniocampa terminatissima Dyar.

This species¹ proves to be synonymous with *Trichorthosia parallela* Grote, as Mr. Jacob Doll has kindly pointed out to me. The species is included in Hampson's fourth volume of the Catalogue of Lepidoptera Phalaenæ, but the genus is not in the table. The spined hind tibiæ and hairy eyes make the form characteristic.

Family GEOMETRIDÆ.

Tephroclystia harlequinaria, new species.

Fore wings light stone-gray with patches of light ochereous. The largest patch occupies the space between veins 3 and 4, overspreading these veins a little and running to the fringe; there is a small patch at the extreme base of wing, a diffuse, indistinctly doubled one on costa at t.-p. line and a small one on vein 6 to outer margin. Lines blackish, waved, scarcely cutting the ochereous shades, marked by little black dashes on the median vein and on all the veins in the t.-p. line, which is regularly and evenly bent outward. Subterminal line fine, white, scarcely enlarged above anal angle. Discal spot black. Hind wings whitish on costal half, the lines distinct near inner margin. A whitish patch at base of abdomen dorsally. Expanse 21 mm.

Two specimens, Victoria, B. C. (E. M. Anderson), Seattle, Wash. (O. B. Johnson); one of the types is in the Provincial Museum at Victoria.

Type.—No. 8176, U. S. National Museum.

Family PYRALIDÆ.

Subfamily GALLERIINÆ.

Cacotherapia nigrocinereella Hulst.

In the ♀ the palpi are very long, three times as long as the head, porrect and thickly scaled; in the ♂ they are extremely

¹ Proc. Ent. Soc. Wash., VI, p. 104, 1904.

short, not exceeding the front. I had a ♂ before me in describing the genus, but did not mention this character, supposing the male to be defective. However, I have now a second specimen from Burnet Co., Texas (F. G. Schaupp) showing the same character, as well as two males and five females of the following species:

Cacotherapia flexilinealis, new species.

Yellowish cinereous, sordid, with a powdering of black scales on the inner part of basal and median spaces. Inner line far outward, slender, linear, black, forming a small but marked outward loop on subcostal and median veins and a short re-entrant angle in the cell. A black discal dot or streak on the cross vein and a more or less distinct one in the center of the cell. Outer line similar to the inner one, incurved on both folds; a terminal black line. Hind wings sordid gray or blackish. Expanse 10-17 mm., very variable in size.

Seven specimens, Brownsville, Texas, May 2, Los Borregos, Texas, May 5 (H. S. Barber), Burnet Co., Texas, March and April (F. G. Schaupp); two of the types are with Mr. W. D. Kearfott.

Type.—No. 8198, U. S. National Museum.

I presume the larva of this species will be found to feed on scale insects as the preceding species does.

Subfamily **EPIPASCHIINÆ**.

Cacozelia alboplagialis, new species.

Antennal process long and heavy, curved, reaching to the middle of the thorax. Maxillary palpi pencil-tufted; hind tibiae with one pair of spurs. Fore wings brown-black, shining, a little more brownish toward anal angle; a large white spot on costa, occupying the middle field, including the black discal dots and some shaded marks along the costal edge. Ordinary lines lightly indicated, approximate below; a black dot in middle of basal space. Base of wing narrowly ochraceous. Hind wing yellowish, subpellucid toward base; traces of an outer black line; outer border brownish; a black line at base of fringe. Expanse 27 mm.

One ♂, Huachuca Mts., Arizona (R. E. Kunzé).

Type.—No. 8194, U. S. National Museum.

Tetralopha melanogrammos Zeller.

Tetralopha melanogrammos Zeller, Verh. zool.-bot. Ges. Wien, xxii, p. 546, 1872.

Katona euphemella Hulst, Ent. Amer., iv, p. 113, 1888.

Wanda tiltella Hulst, Ent. Amer., iv, p. 114, 1888.

Benta speciosella Hulst, Journ. N. Y. Ent. Soc., viii, p. 222, 1901.

Tetralopha euphemella Hulst, Bull. 52, U. S. Nat. Mus., No. 4662, 1903.

Wanda tiltella Hulst, Bull. 52, U. S. Nat. Mus., No. 4665, 1903.

I cannot see more than one species in all this. I have a long series of specimens from Texas and Arizona. The venation is variable.

Tetralopha humerella Ragonot.

Tetralopha humerella Ragonot, Bull. Soc. Ent. France, p. cli, 1888.

Pococera humerella Hampson, Trans. Ent. Soc. Lond., p. 458, 1896.

Tetralopha formosella Hulst, Can. Ent., xxxii, p. 169, 1900.

Dr. Hulst gave me this synonymy and it should have been incorporated in Bulletin 52 of the U. S. National Museum. The larva feeds in the pods of *Gleditschia triacanthos*; U. S. Dept. Agriculture, Bureau of Entomology, Nos. 455 and 5120.

Tetralopha militella Zeller.

Tetralopha militella Zeller, Isis von Oken, p. 880, 1848.

Lanthaphe asperatella Clemens, Proc. Acad. Nat. Sci. Phila., p. 207, 1860.

Benta expandens Walker, Cat. Brit. Mus., xxvii, p. 112, 1863.

Toripalpus taleolalis Hulst, Trans. Am. Ent. Soc., xiii, p. 160, 1886.

Tetralopha fuscolotella Ragonot, Bull. Soc. Ent. France, p. cli, 1888.

Tioga aplastella Hulst, Ent. Amer., iv, p. 113, 1888.

In Bulletin 52, U. S. National Museum this species is represented by three specific names in as many genera. The supposed generic differences may be at once discarded, since they are founded on the variable venation. The amount of white shading on the fore wings is likewise very variable, and it is this, I suppose, which has further influenced the continued separation of the forms. Under the specific name *melanogrammos* Zell., Dr. Hulst gives the variety *diluculella* Grt., with *talleolalis* Hulst as a synonym. This is wrong, I believe, as *diluculella* Grt. is *robustella* Zell., the pine feeder, as given by Sir Geo. F. Hampson.¹ But Hampson continues *talleolalis* Hulst as a synonym to *diluculella*, Grt., which is wrong again, as this form should be attached to *militella* Zell. Hulst's type was one ♀ from Colorado, and I would use the name *talleolalis* to designate the western race of *militella*, which is larger, more diffusely marked, the lines shaded and broadened. I have it from Aweme, Manitoba (Criddle), Winnipeg, Manitoba (Hanham), Stockton, Utah (Spalding), and southern Arizona (Poling). The white shadings vary from extensive to absent.

There is another form, a true variety, not a race, which I would designate by the name *clemensalis*, new variety. It has the thorax and base of fore wing shaded with dull ochereous. It was mentioned by Clemens, but not named. The variety occurs occasionally in eastern material. I have three before

¹Trans. Ent. Soc. Lond., p. 457, 1896.

me: Rhinebeck, New York, July 12, 1888 (Dyar), Plummers Island, Md., July 24, 1902 (Busck); the third is an old specimen without label.

Type.—No. 8216, U. S. National Museum.

The following is a list of the species which I would refer to *Tetralopha*, with their synonyms and food plants where known. The genus *Lanthaphe* Clemens may be recognized as distinct from *Tetralopha* on account of the longer antennal process of the ♂. It contains but one species.

1. *militella* Zeller.....*Quercus, Acer, Fagus.*
asperatella Clemens
expandens Walker
aplastella Hulst
a. *clemensalis* Dyar
b. *talleolalis* Hulst
fuscolotella Ragonot
2. *subcanalis* Walker.....(unknown)
3. *nephelotella* Hulst.....(unknown)
4. *floridella* Hulst.....*Guilandina bonducella*
5. *baptisiella* Fernald.....*Baptisia tinctoria.*
6. *melanogrammos* Zeller.....*Prosopis juliflora.*
euphemella Hulst.
speciosella Hulst.
tiltella Hulst.
7. *humerella* Ragonot.....*Gleditschia triacanthos.*
formosella Hulst.
8. *robustella* Zeller.....*Pinus.*
diluculella Grote.
scortealis Led.
9. *slossonii* Hulst.....(unknown).

Pococera tertiella, new species.

♂ antennæ ciliated, without perceptible basal process; maxillary palpi simple, minute; labial palpi slender, upturned, scarcely to vertex, third joint acicular. Grayish white; inner line black, triplicate, oblique, forming a blotch on the costa; a few raised black scales in the lower part of the median space. Outer line slender, dentate, black, excurved opposite cell. A broad subterminal black shade; a row of terminal black dashes. Expanse 19 mm. One ♂, Brownsville, Texas, May 9, 1904 (H. S. Barber).

Type.—No. 8195, U. S. National Museum.

Ragonot described in 1888 three species of *Pococera*—*variella*, *melanographella* and *texanella*. In Bulletin 52 of the U. S. National Museum, Dr. Hulst makes the two first synonymous and the third the same as *subcanalis* Walker. This latter synonymy seems incorrect, since Hampson¹ puts *subcanalis*

¹Trans. Ent. Soc. Lond., p. 457, 1896.

in *Tetralopha*, after examining Walker's type. I am inclined to view Ragonot's three names as referring to forms of one species, most appropriately named *variella*. I have five specimens from different parts of Texas which I refer to it.

Attacapa callipeplella Hulst cannot be separated generically from *Pococera*. The species may be recognized by the absence of dentations in the outer line.

Subfamily PHYCITINÆ.

✓ *Myelois annuliferella*, new species.

Fore wings elongate, narrow, dark gray, a little pale ochraceous shaded along inner margin. Inner line far from base, strongly bent out over cell, regaining the inner margin by a long, obtuse angle, white, narrow, narrowly black edged without, not sharply contrasted. Discal mark a neat oval ringlet. Outer line nearly straight, a little crenulate, not bent. Terminal dots diffused. Hind wings white, grayish at the margin in the ♀. Expanse 19-23 mm., the ♀ the smaller.

Two specimens, ♂ and ♀, Gallinas Cañon, New Mexico (E. J. Oslar), Yuma Co., Arizona (collection of W. D. Kearfott).

Type.—No. 8193, U. S. National Museum.

✓ *Myelois caliginoidella*, new species.

♂ antennæ simple, broken in the type, but the basal joint and several succeeding ones remain. Labial palpi smooth, upturned to vertex, maxillary palpi scaled. Veins 4 and 5 separate on fore wing, approximate at base on hind wing. Fore wing ashen gray, basal space nearly uniformly light; inner line reddish ochraceous, preceded by a zigzag black line on its lower half, followed by a heavy black shade on costa. Discal dots black, separate. Outer line fine, pale crenulate and incised gently on both folds, enclosed by a black shade that runs from apex to middle of inner margin. A terminal row of dots. Hind wings pale yellowish, fuscous on the costa. Expanse 24 mm.

One ♂, Santa Clara, Cal. (collection of W. D. Kearfott).

Type.—No. 8190, U. S. National Museum.

The specimen bears a label "*Mineola caliginella* Hulst," and it much resembles that species; but it is larger, broader winged and the median shading is differently disposed, besides the differential generic character.

✓ *Rhodophæa intransitella*, new species.

Stout and robust, the ♂ with a large hair-pencil on the metathorax below the hind wings. Light gray, sparsely dusted with black; a large brownish cloud on the inner margin between the lines, shading to yellowish outwardly. Inner line represented by a black dot on costa and a larger triangular spot on the inner margin, lined by pale without, obsolete centrally. Discal dot single, produced outward by a clouded ray. Outer line slightly

roundedly bent inward at discal fold, black, double, faint below; but at apex its edges indicate an oblique black dash. A row of small terminal dots. Hind wings whitish, subpellucid, gray on the edge. Expanse 17-19 mm.

Nine specimens, Albuquerque, New Mexico (E. J. Osler), Phoenix, Arizona (R. E. Kunzé); four of the types are in Mr. W. D. Kearfott's collection. This species somewhat resembles *Myelois transitella* Walker.

Type.—No. 8182, U. S. National Museum.

✓ ***Acrobasis kearfottella***[✓], new species.

As in *A. caryæ* Grote, but the wings washed with a broad pure white shade from base to costa before apex, leaving a black bar on the center of costa, and partly including the discal dots. The inner line is completely cut through. Head and thorax white in the male, gray in the females. No black patches on the wings below in the ♂.

Four specimens, Cleveland, Ohio (W. D. Kearfott), all labelled "*Myelois zonulella* Rag.," obviously incorrectly; one of the types is in Mr. Kearfott's collection. Food plant, hickory.

Type.—No. 8184, U. S. National Museum.

Nephopteryx decipientella[✓], new species.

♂ antennæ slightly bent at the base with a small, compact tuft of scales. Small, narrow-winged, very obscurely marked. Fore wings all blackish gray except a light space about the black discal dots. Base and terminal space a very little lighter, veins dark, a dark terminal line; no other markings discernible. Hind wings pale grayish. Expanse 15 mm.

One ♂ without locality, labelled "A. J. Weidt collection" and "Collection of W. D. Kearfott." Also with a label "*Mineola amplexella* Rag.," to which species it does bear some resemblance.

Type.—No. 8189, U. S. National Museum.

Meroptera afflictella[✓] Hulst.

Salebria afflictella Hulst, Can. Ent., xxxii, p. 170, 1900.

Meroptera liquidambarella Dyar, Proc. Ent. Soc. Wash., vi, p. 108, 1904.

I am satisfied that I have redescribed Dr. Hulst's species. The differences given to separate the genera *Meroptera* and *Salebria* are inconstant, and it is a source of confusion to keep these genera separate. They should be united. *Sic! see not 3-pp!*

✓ ***Meroptera cviatella***[✓], new species.

Basal space, costa and inner margin broadly bright reddish brown, the center of the wing beyond the base purplish gray, the veins pale. Inner line a broad black shade, cut by the narrow whitish line, which starts from the inner edge of the band on costa, is twice angled and ends on the outer edge of the band on the inner margin. Discal dots confluent, clouded.

Outer line whitish, diffused, scarcely darker edged within, bent inward rather sharply on both folds. A terminal row of black dashes. Expanse 22-25 mm.

Two specimens, Chicago, Ill. (A. Kwiat). The female was sent me some time ago by Mr. Kwiat for name, the male I have just received through Mr. Kearfott. The species is near to *mirandella* Rag., but much darker in color. I have named it in honor of the discoverer, though I am not sure that he will recognize his name in the Latin form.

Type.—No. 8186, U. S. National Museum.

Salebria yumaella,[✓] new species.

Fore wing gray, black coarsely powdered on a white ground, nearly uniform. Lower half of basal space darkened. Inner line somewhat curved S-shaped, black on the upper cusp, white on the lower; discal dots black. Outer line white, doubly black edged, the black increased at apex, bent in on both folds. Terminal dots black, powdery, confluent. Hind wings whitish. Expanse 18 mm.

One ♂, Yuma Co., Arizona (collection of W. D. Kearfott).

Type.—No. 8191, U. S. National Museum.

Allied to *odiosella* Hulst, *bakerella* Dyar and *bifasciella* Hulst. From the latter it is separated by the absence of the lower half of the inner black line; from the two former, by the smaller size and narrower markings.

✓ **Salebria nogalesella**,[✓] new species.

Dark bluish gray, cinereous and blackish scales mixed. Basal space lighter outwardly. Inner line broad, black, divided by a narrow, pale, zigzag line. Discal spots joined. Outer line curved at discal fold, straight and crenulate below, pale, finely black edged within. A terminal row of black dots. Hind wings subpellucid yellowish fuscous, darker on the edge. Expanse 20 mm.

One ♂, Nogales, Arizona (E. J. Oslar).

Type.—No. 8192, U. S. National Museum.

This falls near *Meroptera pravella* Grote, but looks so differently that I cannot leave it under that label. The markings are about the same, but the color is brighter gray and more powdery. I have compared also the descriptions of *Meroptera uvinella* Rag., and *Salebria subfuscella* Rag., which are very near to *pravella* if not synonymous therewith; but do not find that they apply to *nogalesella*.

Megasis aridella,[✓] new species.

Fore wings nearly white with blackish shadings, faintly ocherous in the terminal space, all the veins lined with black. Inner line broken, showing an angle on vein 1 and a patch on the median vein and on costa; two discal

dots; outer line bent inward on both folds, clouded, gray, white edged without; a row of terminal dots. Hind wing nearly pure white; a gray terminal line and a narrow one in the pale fringe. Expanse 35-37 mm.

Two specimens, ♂♂, Stockton, Utah (T. Spalding); one of the types is with Mr. Kearfott.

Type.—No. 8188, U. S. National Museum.

This is a desert form of *Megasis*, recalling the Asiatic *M. alpherakii* Rag.

✓ *Melitara fernaldalis* Hulst.

Melitara fernaldalis Hulst, Trans. Am. Ent. Soc., XIII, p. 163, 1886.

Euzophera gigantella Ragonot; Nouv. Gen. et Sp. Phyc. Gall., p. 32, 1888.

Melitara fernaldalis Schwarz, Psyche, VIII, Suppl. I, p. 13, 1899.

Honora cinerella Hulst, Journ. N. Y. Ent. Soc., VIII, p. 223, 1901.

Euzophera gigantella Dyar, Proc. Ent. Soc. Wash., VI, p. 158, 1904.

This species differs from Hulst's definition of *Melitara* in that the ♀ antennæ are without pectinations. It is also longer and narrower winged than the other species of *Melitara*. This has caused the female to be twice redescribed under other genera, as I have noted. The larva feeds in the giant cactus (*Cereus giganteus*) as described by Mr. Schwarz.

✓ *Yosemetia maidella*, new species.

♂ with the costa concave, recalling *Pseudoschænobius opalescalis* Hulst, but the maxillary palpi invisible and vein 11 of fore wings free from vein 12. Light ashen gray, ground nearly white, rather thickly dusted with black. An ochereous bar on inner margin at inner line, always faint, sometimes absent, preceded by a group of black scales, followed by a zigzag blackish line which spreads diffusely on the veins without. Subcostal and outer veins black lined. Discal dot double; outer line clouded, streaked, bowed inward at discal fold. Hind wings subpellucid pale grayish. Expanse 25-30 mm.

Twenty-two specimens, Stockton, Utah (T. Spalding); thirteen of the types are in the collection of Mr. W. D. Kearfott.

Type.—No. 8180, U. S. National Museum.

✓ *Yosemetia mysiella*, new species.

Similar to the preceding, but smaller, the yellow bar more distinct, both lines less angled and narrower; the powdering on the wings is uniform and not streaked on the veins; the costa of the ♂ is not concave. Expanse 23-26 mm.

Sixteen specimens, Stockton, Utah (T. Spalding), Phoenix, Arizona (R. E. Kunz); seven of the types are in the collection of Mr. W. D. Kearfott.

Type.—No. 8181, U. S. National Museum.

→ *Zophodia grossulariæ* Riley.

Pempelia grossulariæ Riley, Rept. Ins. Mo., I, p. 140, 1869.

Dakruma turbatella Grote, Bull. Geol. Surv. Terr., IV, p. 702, 1878.

Euzophera franconiella Hulst, Trans. Am. Ent. Soc., XVII, p. 177, 1890.

Zophodia bella Hulst, Can. Ent., XXIV, p. 61, 1892.

Zophodia grossulariæ Hulst, Bull. 52, U. S. Nat. Mus., No. 4821, 1902.

Zophodia bella Dyar, Proc. Ent. Soc. Wash., VI, p. 228, 1904.

I cannot see any specific difference between Hulst's *bella* and the old *grossulariæ*. The Western form, as I have noted, is distinguishable as a race, being larger, with the markings heavily contrasted. It is unfortunate that the names *turbatella*, *bella* or *franconiella* cannot be used for it; but these were all based on Eastern specimens. I have the Western form from Manitou, Col. (Dyar), Seattle, Wash. (O. B. Johnson), Oregon (Koebele) Kaslo, B. C.¹ (Dyar) and Wellington, B. C. (G. W. Taylor, Th. Bryant).

✓ *Zophodia orobanchella* Dyar.

I think that this species² will prove to be the same as *packardella* Rag. I have now additional specimens from Phoenix, Arizona (R. E. Kunzé), and while they do not agree with Ragonot's description, his figure strongly suggests them by its wing shape and round discal dot. I suspect that Ragonot's single type may have been in bad condition, so that the lines were not visible.

✓ *Zophodia perdubiella*, new species.

Palpi porrected, second joint thickened by scales, third slender, deflexed, not long and beak-like. Wings narrow, elongate; form slender. Ashen gray, a few lighter scales along the costa and a trace of darker discal dots; all the marks obsolete. Expanse 22-26 mm.

Two specimens, Stockton, Utah (T. Spalding).

Type.—No. 8187, U. S. National Museum.

A single specimen of *Yosemetia aureomaculella* Dyar from this same locality, very lightly marked and somewhat worn, almost exactly matches these specimens, but is easily distinguishable by the much longer palpi.

✓ *Lætilia ephestiella* Ragonot.

Dakruma ephestiella Ragonot, Diag. N. Am. Phyc., p. 13, 1887.

Lætilia ephestiella Dyar, Proc. Ent. Soc. Wash., VI, p. 159, 1904.

Maricopa lustrella Dyar, Proc. Ent. Soc. Wash., V, p. 227, 1903.

In my *Maricopa lustrella* the tongue is very small, but not

¹ Incorrectly referred to as *Z. packardella* Rag., Proc. U. S. Nat. Mus., XXVII, p. 921, 1904.

² Proc. Ent. Soc. Wash., VI, p. 111, 1904.

enough so to refer the species to the genus *Maricopa*. When corrected in this respect, it falls in *Lætilia*, and I cannot distinguish it from Ragonot's species, to judge from his description.

✓ ***Staudingeria albipennella* Hulst.**

Pempelia albipennella Hulst, Ent. Amer., III, p. 133, 1887.

Staudingeria albipennella Ragonot, Rom. Mém., VIII, p. 136, 1901.

Staudingeria perluteella Dyar, Proc. Ent. Soc. Wash., VI, p. III, 1904.

Staudingeria olivacella Dyar, Proc. Ent. Soc., Wash., VI, p. III, 1904.

Mr. Kearfott has put into my hands a long series of this species, which shows that my *perluteella* and *olivacella* are but the extremes of variation of one form. The names may be used to designate the varieties.

✓ ***Heterographis morrisonella* Ragonot.**

I have before me a series of 50 specimens of this species, most of them from Mr. Kearfott's collection. I can match Ragonot's figures of *coloradensis* and *morrisonella*, but there is nothing that would fit the form *olbiella* Hulst, which is said to have "all the wing washed with vinous red." Now I have a ♀ specimen identified by Dr. Hulst as *olbiella*, which is entirely washed with vinous red; but it is *Staudingeria albipennella*, not *Heterographis morrisonella*. I am aware that Dr. Hulst's determinations are not generally reliable and that his description of *olbiella* covers ochraceous as well as brown forms; therefore, I would refer *olbiella* as a synonym to *morrisonella*, not as a variety. The name *morrisonella* will stand for the dark form and *coloradensis* for the pale one. The two are not sharply separated, but intergrade.

✓ ***Homæosoma oslarellum*, new species.**

Fore wing dark blackish, relieved by a scattering of gray scales on the costal portion, especially at base of costa. Lines wanting, the outer shadowed in gray scales; discal dots black, small, obscure. Hind wing grayish, subpellucid, lighter towards the inner margin; fringe pale. Expanse 17-22 mm.

Eleven specimens, Chimney Gulch, Golden, Colorado (E. J. Oslar); five of the specimens are in Mr. Kearfott's collection.

Type.—No. 8185, U. S. National Museum.

Nearly allied to *H. electellum* Hulst, but much darker and with obsolete lines.

✓ ***Homæosoma striatellum*, new species.**

Pale gray, veins all lined with black, lines nearly obsolete. The light gray of the ground color is dusted with blackish; a distinct black line along subcostal and median veins, the veins outwardly more or less distinctly

lined. Inner line blackish, clouded, oblique and with a strong angle on the median vein, varying from distinct to but a trace. Outer line oblique, blackish, clouded, always fainter than the inner line and often hardly traceable. Discal dots indicated by slight enlargements at the ends of the lines on subcostal and median veins. Hind wings whitish, subpellucid, narrowly ashen at the margin. Expanse 18-22 mm.

Twelve specimens, Phoenix, Arizona (R. E. Kunzé), Death Valley, California (A. Koebele); four of the types are in the collection of Mr. W. D. Kearfott.

Type.—No. 8179, U. S. National Museum.

✓ **Eurythmia spaldingella**, new species.

Narrow winged; gray, black scales on a whitish ground. Inner line whitish, black edged without, produced outward in the cell in a long point. Discal dots small, double. Outer line near the margin, whitish, nearly straight, with a black shade within. A terminal black line. Markings all rather powdery, but distinct. Hind wings pallid, subpellucid. Expanse 14-15 mm.

Four specimens, Stockton, Utah (T. Spalding); two of the types in Mr. Kearfott's collection.

Type.—No. 8183, U. S. National Museum.

This may be *E. coloradella* Hulst which is not before me, but only so on the assumption that Hulst's type has lost the markings.

Barberia ✓, new genus.

Fore wings with nine veins, 5 and 8 absent, 3 and 4 separate, 9 and 10 stalked; hind wings with seven veins, 5 absent, 2 well before the angle of the cell, 3 and 4 stalked, 8 short but distinct. Labial palpi slender, sharply ascending, almost erect, smooth and closely scaled, the third joint nearly as long as the second; maxillary palpi simple; tongue minute; ♂ antennæ simple.

Barberia affinitella, new species.

Fore wings blackish brown with a broad white costal stripe; inner area a little lighter, especially toward base. Expanse 11 mm.

Six specimens, Brownsville, Texas, Los Borregos, June 5, 1904 (H. S. Barber).

Type.—No. 8196, U. S. National Museum.

The venation is possibly variable. If there were 10 veins in the fore wings the species would fall in *Hypsotropa*; but it differs therefrom in the palpi. It closely resembles *Homosassa ella* Hulst in appearance, but the palpi are even more different.

—The following paper by Mr. Banks was read by the Recording Secretary:

AN ALLEGED PARASITIC TYROGLYPHID.

BY NATHAN BANKS.

Tyroglyphids have been found in many situations where one would never expect them, nor easily explain their presence. They have a minute migratory stage which may be attached to various insects, and in this way they may be transported far from their birthplace. It was one of these mites that an Eng-

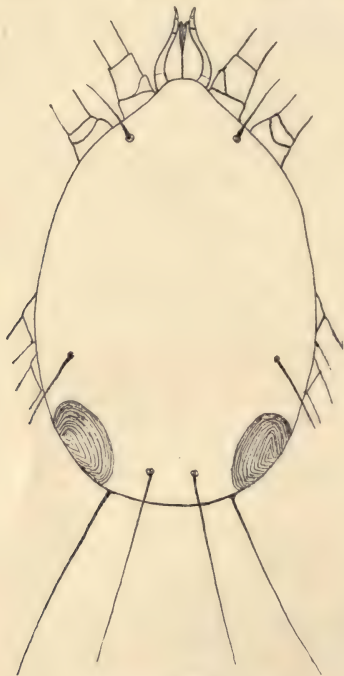


FIG. 6 — *Carpoglyphus alienus*, ♀.

lishman thought he had produced by means of electricity. Not the least remarkable of the many strange habitats, is that in the following case:

Early in 1904 Dr. J. de Haan, Director of the Geneeskundig Laboratorium te Weltevreden of Batavia, Java, sent to me for determination some mites found in the urine of a patient affected with a kidney disease. Every time he passed urine some of these acarians were found surrounded in pussy matter.

There seemed no doubt to Dr. de Haan that it was a genuine case of endoparasitism. An acarologist familiar with the alleged habitats of various Tyroglyphids cannot suppress his suspicions in the case. Yet, as it is stated that mites were found in every passage of urine, it seems impossible to account for

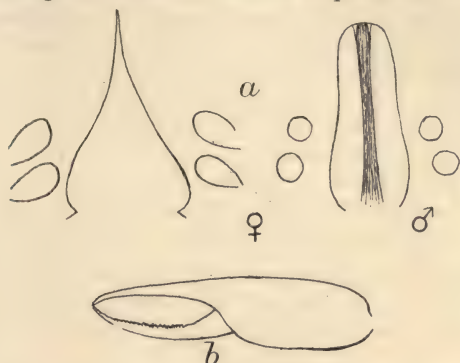


FIG. 7.—*Carpoglyphus alienus*; *a*, genital openings, ♂ and ♀; *b*, mandible.



FIG. 8.—*Carpoglyphus alienus*, legs I and IV.

their adventitious occurrence. Were the mite of some other family it would not be so strange, but that a Tyroglyphid could get to the internal organs, other than the alimentary tract, seems beyond belief. Yet there cannot be the slightest doubt as to the systematic position of the mite as can readily be seen from the figures. The nature of the genital openings and the position of the long bristle on tibia I seems to place the specimens in the genus *Carpoglyphus*. The caroncles are not as distinct as in the one known species of this genus, but the position of the bristle on tibia I is unique. I shall therefore simply describe the species leaving the question of its occurrence to the future.

Carpoglyphus alienus, new species.

Body nearly elliptical, rather pointed in front, broadly rounded behind; without separation between cephalothorax and abdomen; with but few hairs above; a pair in front between legs I and II, a submarginal pair above leg IV, and two pairs of longer ones behind; the median pair are on the dorsum, the other pair on the posterior margin; a large dark elliptical spot each side behind. Legs of moderate length and slenderness; leg I has the long hair from near middle of penultimate joint; the basal clavate hair of tarsus is curved near tip. The caroncles are not very distinct, but the claws are large. In leg IV the tarsus is fully twice as long as the metatarsus. The vulva of the female, which is well forward and intercoxal, shows two divaricate lines, and each side two oval suckers. The male opening is farther back, and nearly three times as long as broad, rather broader behind, and the sides slightly concave; there are two circular suckers each side.

Various specimens found in urine, Batavia, Java.

It differs from *C. passularum* in the less hairy legs, and apparent lack of short hairs on dorsum, as well as in genital apertures.

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The following papers were submitted to and accepted by the Publication Committee:

REMARKS ON GENITALIC GENERA IN THE CULICIDÆ.

By HARRISON G. DYAR.

In a recent publication¹ Dr. E. P. Felt has figured the genitalia of the ♂♂ of a number of species of Culicidæ, and in a brief

¹ Bull. 79, N. Y. State Mus., 1904.

appendix erects seven new genera, describing the venation and genitalic characters of each. The venational characters seem to be of an indefinite nature, and we might as well frankly regard the genera as founded on the genitalia alone. These certainly show well marked and distinctive characters. I have received from Dr. Felt photographs of many of his slides and have had others prepared by the kindness of Mr. H. S. Barber. It is of especial interest that the genitalic groups run largely parallel to those defined on larval characters, in some cases con-



FIG. 9.—Male genitalia of *Grabhamia cantator* Coq.: a, side piece or basal segment of clasp; b, basal lobe of same, or claspette; c, sub-apical lobe of same; d, clasp filament or terminal segment of clasp; e, articulated apex of same; f, harpe, basal segment; g, harpe, terminal segment; h, harpago; i, appendage of 8th segment; j, position of the unci (they cannot be detected in the specimen before me).

firming larval affinities where it had been heretofore supposed that these were contradicted by the adults. A case in point is that of *Janthinosoma musicum*, *Culex jamaicensis* and *Tæniorhynchus signipennis*. These larvæ are very peculiar and essentially alike. The adults have been considered unrelated; but the genitalia are in some respects very similar and place these forms close together. This leads me to conclude that the genitalic groupings, where reinforced by the larval ones, show natural divisions, and I am, therefore, in accord with Dr. Felt

in using them as the basis for genera. It is true that in general practice other characters than these are preferable, owing to the necessity of preparing the specimens and to the fact that the characters are shown by one sex only, and that the one not generally collected. I believe, however, that since the groups are natural ones it is probable that other recognition characters will be found. If they should not be, it might be better to reduce the genitalic genera to subgeneric rank, for practical reasons, without thereby losing sight of their value. It seems inevitable that the genus *Culex* shall be divided, and the genitalic divisions are more natural than those recently founded on scales and papal structure. As to the latter it is necessary to remove and mount the palpi, which is as practically objectionable a process as any connected with the study of the ♂ genitalia.

The sketch herewith of *Grabhamia cantator* Coq., shows the names applied to the different parts. They vary much in amount of development as well as in shape in the different species. *Anopheles* shows the simplest arrangement, scarcely distinguishable from the *Corethrinæ*. This is in accord with the larval characters, since *Anopheles* larvæ are very close to some *Corethrid* forms, as *Eucorethra* and *Dixa*. The *Culicinæ* have a small articulated tip to the terminal segment of the clasper, which appears to be lacking in the *Aëdinæ*, although in *Uranotenia sapphirina* there is a small spine much resembling it and probably representing its rudiment. The species of *Culex* show the most differentiation, especially in the true *Culex* or *pipiens* group and these are the most specialized larvæ. We have thus a concordance in general as well as special characters between genitalic and larval structure.

I have thrown the forms known to me into a synoptic table of genera, which follows. A few new names are supplied to fill gaps left in Dr. Felt's groupings or as corrections. Nine generic names, out of a total of thirty-one credited to our fauna, are omitted, as I have had no material to dissect.

1. Harpes and harpagones absent or greatly reduced; clasp segment strong and longer than the basal segment. *Anopheles*
 Harpes and harpagones developed; clasp segment usually shorter than the basal segment. 2
2. Terminal clasp without a terminal articulated spine, though often otherwise modified, branched or spinous. 3
 Terminal clasp with an articulated spine which is usually apical; clasp usually simple, seldom modified. 6
3. Clasp transparent, membranous. 4
 Clasp chitinous, solid. 5

4. Clasp inflated, lobed, irregular, apparently erectile *IVyeomyia*
Clasp broad, simple, with minute apical spine *Uranotænia*
5. Clasp enlarged, clawed, hirsute on the outer aspect *Deinocerites*
Clasp slender, bifurcate, arising subapically *Aedes* ✓
6. Harpes filamentous or papillose, slender, delicate 7
Harpes not filamentous, chitinous or spined 11
7. Harpes filamentous; unci reduced or invisible 8
Harpes papillose-capitate; unci an undivided basal cone, *Janthinosoma*
8. Harpes broadened at base, not jointed; outer lobe of side piece finger-shaped *Protoculex* ✓
Harpes not broad at base, jointed centrally 9
9. Side piece with a heavy terminal brush; harpes hooked . . . *Pseudoculex* ✓
Side pieces without terminal brush 10
10. Harpes hooked by a slender retrorse spine *Culiselsa* ✓
Harpes not hooked *Grabhamia* ✓
11. Clasp with an outward angle and spines; harpes touching to form a ring-shaped structure *Psorophora* ✓
Without these characters; clasp simple 12
12. Terminal clasp expanded, narrow bladder-like 13
Terminal clasp filamentous 14
13. Basal lobe of side piece setose *Feltidia*
Basal lobe of side piece a thick chitinous rod *Coquillettidia*
14. Side piece with a subapical process within bearing setæ and filamentous or leaf-like appendages 20
Side piece without such a process 15
15. Clasp with the articulated tip subterminal *Ecculex* ✓
Clasp with the articulated tip terminal 16
16. Side pieces short conical; harpes with long branch at base, *Stegomyia* ✓
Side pieces long conical; harpes not so branched 17
17. Harpes with trifid apex; tip of clasp multiple divided . . . *Pneumaculex* ✓
Harpes with simple or spinous apex 18
18. Appendicular tip of clasp long *Megarhinus*
Appendicular tip of clasp minute 19
19. Unci not forming a central projecting sac *Theobaldia*
Unci united into a large central projecting sac *Culicella*
20. Harpes nearly simple, dentate only 21
Harpes heavily spined, often recurved *Culex*
21. Leaf-like scale of apical lobe of side piece absent *Neoculex*
Leaf-like scale present; setæ arising from a second, basal lobe
Melanoconion

Genus ANOPHELES Meigen.

Type: bifurcatus Linn. The genitalic type has been figured by Theobald and Felt. Nine species are recorded from North America, viz: *maculipennis* Meig., *plumbeus* Hal., *bifurcatus* Linn., *punctipennis* Say, *pseudopunctipennis* Theob., *franciscanus* McC., *barberi* Coq., *crucians* Wied., *eiseni* Coq.

Genus CELLIA Theobald.

Type: pulcherrima Theob. The genitalia will probably prove similar to those of *Anopheles*. I have not seen them of either of the species recorded from North America, viz: *argyrotarsis* Desv., *albipes* Theob.

Genus CYCLOLEPPTERON Theobald.

Type: grabhamii Theob., the only species recorded from our region. The genitalia are unknown to me.

Genus ARRIBALZAGIA Theobald.

Type: maculipes Theob. This species is recorded from Trinidad and will doubtless be found in the southern portion of our region. The genitalia have not been examined.

Genus PSOROPHORA Desvoidy.

Type: ciliata Fab. We are credited with three species, viz: *ciliata* Fab., *howardii* Coq., *scintillans* Walk. The genitalia of *ciliata* have been figured by Dr. Felt.

Genus MEGARHINUS Desvoidy.

Type: hæmorrhoidalis Fab. We are credited with seven species, viz: *rutilus* Coq., *portoricensis* Von Röd., *ferox* Wied., *grandiosus* Will., *hæmorrhoidalis* Fab., *longipes* Theob., *separatus* Arrib. Mr. Barber has made me a nice mount of the genitalia of *portoricensis*, from which the characters given in the table were taken.

Genus STEGOMYIA Theobald.

Type: fasciata Fab. Besides this species, *sexlineata* Theob. may occur with us. The genitalia of *fasciata* are distinctive as may be inferred from the preceding table.

Genus PNEUMACULEX, new genus.

Type: signifer Coq. This species is peculiar in many ways and deserves a distinct generic appellation. The larva has besides the peculiar dorsal plate an enlargement of the tracheal tubes into a sort of bladder in the thorax, suggesting *Corethra*. In the ♂ genitalia the side pieces are conic, without apical lobe; basal lobe small but bearing two stout setæ; terminal clasp slender, enlarged a little outwardly with a multiple articulated tip. Harpes short, chitinous, concave, with trifid apex; harpagones small, slender, chitinous, acute; another pair of appendages more basally placed, shorter than the harpagones, with a terminal hook; a median, divided, double-tipped membrane (unci?).

Genus TÆNIORHYNCHUS Arribalzaga.

✓ *Type: titillans* Walk. Theobald takes *fasciolatus* Arrib. as the type of *Tæniorhynchus*, but the first species is *tæniorhynchus* Arrib. (nec Walker) = *titallans* Walk., and should be the type. This species is also the type of *Mansonia* Blanchard, which will become a synonym of *Tæniorhynchus*. The species has been recorded from Trinidad and will doubtless be found in the southernmost part of our territory. I do not know the genitalia.

Genus COQUILLETIDIA, new genus.

✓ *Type: perturbans* Walk. Theobald places this species in *Tæniorhynchus* Arrib., but not correctly, I believe. The genitalia are peculiar. Dr. Felt has prepared them from a specimen which I sent him, but the figure is not reproduced in his bulletin. The characters may be gathered from the table. Four species are referred here, viz: *richardii* Fic., *perturbans* Walk., *confinis* Arrib., *nigricans* Coq.

Genus FELTIDIA, new genus.

✓ *Type: jamaicensis* Theob. Dr. Felt has taken *jamaicensis* as the type of *Grabhamia*, but Theobald mentions first *dorsalis* Meig. Of *jamaicensis*, Theobald gives a rough figure and Felt a good photograph. We have three species at present referable here, *jamaicensis* Theob., *cyanescens* Coq., *signipennis* Coq.

Genus JANTHINOSOMA Arribalzaga.

Type: discruciens Walk. We have five species, viz: *musicum* Say, *posticatum* Wied., *lutzii* Theob., *discruciens* Walk., *varipes* Coq. Dr. Felt has prepared the genitalia of *musicum* and *lutzii* which are much alike. He has figured the former.

Genus JOBLOTIA Blanchard.

Type: niveipes Theob. The name is a substitute for Theobald's *Trichosporon* (nec *Trichosporus* Macq.) The single species is recorded from Trinidad, but probably occurs with us. I have not seen the genitalia.

Genus ECCULEX Felt.

✓ *Type: sylvestris* Theob., the only species. It has most remarkably distinct genitalia and is apparently not at all allied to *Grabhamia* as one would have supposed. Dr. Felt has published a photograph.

Genus PSEUDOCULEX, new genus.

✓ *Type: aurifer* Coq. As noted below, I think this is a distinct generic type. The characters are given in the preceding table and in Dr. Felt's figure.¹

¹ Pl. 33, fig. 2.

Genus CULICELSA Felt.

✓ *Type: tæniorhynchus* Wied., the only species properly referred here. Dr. Felt adds *aurifer* Coq., but I consider this to represent a distinct generic type. I am doubtful, moreover, whether the hook on the harpes is to be considered a generic character. If not, *Culiselsa* falls in with the following.

Genus GRABHAMIA Theobald.

✓ *Type: dorsalis* Meig. Synonym, *Culicada* Felt, type *canadensis* Theob. I have not seen the genitalia of *dorsalis*, but Theobald figures the larva of it and the genitalia of a closely allied species. This is our largest genus. Sixteen species are referred here with certainty, viz: *canadensis* Theob., *dupreei* Coq., *sollicitans* Walk., *cantans* Meig., *atropalpus* Coq., *cantator* Coq., *varipalpus* Coq., *curriei* Coq., *impiger* Walk., *lazarensis* F. and Y., *pullatus* Coq., *trichurus* Dyar, *triseriatus* Say, *punctator* Kirb., *æstivalis* Dyar, *onondagensis* Felt, and twenty-five others more or less probably, viz: *trivittatus* Coq., *fitchii* F. and Y., *squamiger* Coq., *abfitchii* Felt, *testaceus* Wulp, *bigotii* Bell, *excrucians* Walk., *impatiens* Walk., *annulatus* Schv., *confirmatus* Arrib., *scholasticus* Theob., *inflictus* Theob., *hirsuteron* Theob., *rubidus* Desv., *nigripalpus* Theob., *janitor* Theob., *palus* Theob., *similis* Theob., *bimaculatus* Coq., *discolor* Coq., *fletcheri* Coq., *nanus* Coq., *niveitarsis* Coq., *vittata* Theob., *spenceri* Theob. The genitalia of several have been figured.

Genus PROTOCULEX Felt.

✓ *Type: serratus* Theob., the only species so far represented. Dr. Felt has briefly described the genitalia, though he has not figured them. I have a fine photograph of the parts from him, and a figure may be expected later, I presume.

Genus THEOBALDIA Neveau-Lemaire.

✓ *Type: annulata* Meig. *Culiseta* Felt is a synonym, with type *absobrinus* Felt. Five species will be referred here, though their synonymy is not settled. They are *annulata* Meig., *incidens* Thom., *consobrinus* Desv., *absobrinus* Felt, *magnipennis* Felt.

Genus CULICELLA Felt.

✓ *Type: dyari* Coq., well figured by Dr. Felt. *Melanurus* Coq. also falls here, having essentially the same structure, though the basal plate is less developed. Dr. Felt referred it to *Ecculex*, but I cannot see that it has any affinity therewith.

Genus NEOCULEX, new genus.

✓ *Type: territans* Walk. This species may be separated from *Culex* proper on the characters given above. Dr. Felt figures

a portion of the genitalia, but his figure does not show the peculiar basal organs.

Genus CULEX Linnæus.

Type: pipiens Linn. As now restricted, the genus is a small one. But five species are certainly referred to it, viz: *pipiens* Linn., *tarsalis* Coq., *restuans* Theob., *fatigans* Wied., *salinarius* Coq.; to which should probably be added *secutor* Theob.

Genus MELANOCONION Theobald.

Type: atratus Theob. Though belonging near *Culex* the male genitalia show a distinct type. A second species, *spisipes* Theob., is recorded from Trinidad.

Genus DEINOCERITES Theobald.

Type: cancer Theob. The genitalia have been figured by Theobald and are very peculiar. The same may be said of most of the *Aëdinæ*.

Genus AEDES Meigen.

Type: cinereus Wied. Two species are credited to our fauna, viz: *fuscus* O.-S. and *perturbans* Will. The genitalia of *fuscus* have been figured by Dr. Felt.

Genus HOWARDINA Theobald.

Type: walkeri Theob. The genitalia are unknown to me.

Genus WYEOMYIA Theobald.

Type: grayii Theob. We have four species, viz: *grayii* Theob., *pertinans* Will., *trinidadensis* Theob., *smithii* Coq. The peculiar genitalia of *smithii* have been briefly described by Dr. Felt.

Genus PHONIOMYIA Theobald.

Type: longirostris Theob. Not studied.

Genus URANOTÆNIA Arribalzaga.

Type: nataliæ Arrib. We have three species, viz: *sapphirina* O.-S., *lowii* Theob., *socialis* Theob. Dr. Felt gives the genitalia of *sapphirina*.

Genus AEDOMYIA Theobald.

Type: squammipenna Arrib., is recorded from Trinidad.

Genus HÆMAGOGUS Williston.

Type: cyaneus Fab., not studied.

ON THE SPECIES OF SPHENOPHORUS RELATED TO PERTINAX OL., WITH DESCRIPTIONS OF OTHER FORMS.

By F. H. CHITTENDEN, Sc. D.

The series of descriptions of new species of *Sphenophorus* presented in this paper were, for the most part, prepared in the spring of 1903. Before the main work on this genus, which it is contemplated will be in the form of an illustrated revision, could be completed, press of other more imperative duties caused its almost complete abandonment. As a consequence the writer has not found time to bring together all of the matter desired to be presented on this topic. The present paper is in continuation of two others published in Volume IV of the Proceedings, pp. 128-137, which treated of species hitherto considered as *simplex* LeConte and *placidus* Say, respectively. Its presentation for publication at this time is made necessary because of the desirability of returning material which has kindly been loaned by various institutions and private collectors for study, and because it cannot now be foretold when opportunity will offer for the completion of the monographic work originally planned. This preliminary article will be followed by one or more additional contributions as rapidly as opportunity offers.

As with the several species that have been generally placed in collections as *placidus* Say, we find that *pertinax* Ol. readily separates into several undescribed forms in addition to those which were named by Dr. Horn in his paper on the Curculionidæ of the United States published in 1873 (Proc. Amer. Philos. Soc., vol. XIII, 1873, pp. 417-421.) The species of this group may be characterized as follows:

PERTINAX group.

Rostrum arcuate, from three-fourths to the same length as the thorax, considerably dilated at base, channeled, interocular puncture at base terminating in a finely impressed line beyond the scrobes.

Thorax usually distinctly trivittate, occasionally subobsoletely so (*abrasus* and *maidis*); vittæ entire, subequal in length and width, median not forked anteriorly, extending nearly or quite from apex to base; lateral vitta with an outer branch extending from near the middle nearly to the base.

Elytral intervals unequal in width, and varying in convexity.

Third joint of anterior tarsi about twice (*i. e.*, more or less) as wide as the first joint; of the middle pair perceptibly narrower than the anterior; of the posterior pair one-sixth to one-half wider than the first with occasionally slight individual variation in the same species. For convenience of reference this may be expressed in the following formula: ant. $2+$; mid. $2-2$; post. $\frac{1}{8}-\frac{1}{2}$.

The sexual characters are strongly developed, especially in the ♂ of many forms. Thus, in *ludovicianus* the metasternum and first abdominal segment are as deeply and widely concave as in the *æqualis* or *ochreus* group. The species are mostly large, from three-eighths of an inch in length to double that size.

Rostrum subcylindrical, slightly narrower at extreme base, angles rounded.

Elevated intervals irregular and interrupted; unelevated intervals interrupted by elevated shining black areas. Second abdominal segments of ♂ without transverse brush of setæ.

Thoracic vittæ distinct.

Lower surface coarsely punctate. Ventral concavity of ♂ moderately deep; metasternum with tuft of long, sparse, fine hairs nearly covering each side of posterior half. Tibiæ sparsely fimbriate with short bristle-like hairs. U. S.,

pertinax Olivier.

Lower surface more finely punctate. Ventral concavity of ♂ more shallow; metasternum with a few minute hairs each side along posterior margin. Tibiæ densely fimbriate with long hairs. Cal., Nev., Ore. *typhæ*, n. var.

Thoracic vittæ subobsolete. Cal. *abrasus*, n. sp.

Rostrum moderately, subequally compressed, posterior angles of apex acute or subacute, scarcely produced.

Thoracic vittæ with curved or sinuous outlines.

Second abdominal segment of ♂ with a short transverse brush of brown setæ; metasternum of ♂ with a lateral row of short setæ each side in concavity.

Elytra mostly opaque gray; odd intervals convex, black and shining; even ones thickly coated, flat except a narrow, more or less distinctly elevated, smooth black median line.

Rostrum about three-fourths as long as thorax.

E. U. S. *setiger*, n. sp.

Elytra mostly shining black; even intervals nearly as convex and prominent as odd ones.

Rostrum as long as, or five-sixths the length of, the thorax. La., Tex. *ludovicianus*, n. sp.

Elytra, except humeri and basal elevated portions of first and sometimes third intervals, covered with natural thick ochraceous coating which extends to the sides. Other intervals subequal. Body slender. Fla., *peninsularis*, n. sp.

Elytra with natural thin subsericeous gray coating, black lines between the stria punctures. Body robust, rostrum shorter. Mich.—Cal. *robustus* Horn.

Rostrum strongly compressed at apical fourth or fifth, and suddenly bent backward, anterior face of apex flat or slightly concave, posterior angles obtuse. Thoracic vittæ subparallel.

Elytral intervals alternately black or coated.

Thoracic vittæ moderately curved, nearly straight, moderately separated. Elytral intervals 1, 3, 5, and 7 long, broad and costiform, black and shining; 2, 4, 6, and 8 narrower, with distinct alutaceous coating. Scutellum elongate, concave. Anterior face of apex of rostrum more or less concave. First ventral segment of ♂ with small dense tuft of brown setæ each side, sometimes much abraded, metasternum sometimes with a few scattering setæ. E. U. S. and N. W. *costipennis* Horn: Thoracic vittæ less elevated, feebly curved and sinuous. Intervals 1, 3, 5, and 7 with *elevated* portions narrower; elevated portion of 3 and 5 short and narrowed apically, of 7 still narrower or wanting. Scutellum flat, deltoid. Anterior face of apex of rostrum flat or feebly concave. Ventral segments 1 and 2 of ♂ nearly uniformly sparsely villous, last with long hairs. Mass., N. Y., Va., D. C. *villosiventris*, n. sp.

Elytral intervals all black and polished.

Thoracic vittæ more curved or sinuous, wider and less distinctly separated. Elytral intervals with alternate widest ones moderately elevated, narrower ones nearly or quite naked. Scutellum elongate, concave. First ventral segment and metasternum of ♂ with lateral tufts of brown setæ. Utah,

levigatus, n. sp.

Rostrum strongly, subequally compressed throughout, anterior face of apex deeply concave, posterior angles acutely produced.

Thoracic vittæ subobsolete, frequently confluent anteriorly. Lower surface scarcely less strongly punctate at the middle than at the sides.

First ventral segment of ♂ feebly concave. Kans., Ala., S. C. *maidis*, n. sp.

Sphenophorus pertinax Olivier.

Calandra pertinax Olivier, Entom. Hist. Nat. des Insectes, v, No. 83, p. 90, pl. 28, fig. 417, 1807.

Sphenophorus pertinax Gyllenhal, in Schönherr's Gen. et Sp. Curc., iv, p. 938, 1837; Horn, Proc. Am. Phil. Soc., pp. 418, 419, 1873.

Sphenophorus truncatus Say, Descr. N. A. Curc., p. 22, 1831; Compl. Writings, Lec. Ed., i, p. 288.

Sphenophorus ? *canaliculatus* Boheman, in Schönherr's Gen. et Sp. Curc., viii, 2, p. 253, 1845.

Length 11-15 mm., width 4.2-5.5 mm.

This species is correctly named in most collections, although it frequently happens that the label specimen is quite otherwise, *e. g.*, *ludovicianus*. The outline illustration of the rostrum (fig. 10, a), which is about four-fifths the length of the



FIG. 10.—Outline views of the rostrum in *Sphenophorus*: *a*, *pertinax*; *b*, *ludovicianus*; *c*, *costipennis*; *d*, *maidis*; *e*, *villosiventris*—all greatly enlarged (original).

thorax, will facilitate its separation from species with which it is confused, *costipennis* among others.

The distribution extends from New York City to Utah, but southward the typical form does not appear to have been collected beyond the District of Columbia. It is a very common species and occasionally injurious to corn.

With erstwhile varieties eliminated as species, *pertinax* still exhibits considerable variation. The merely colorational varieties are scarcely worth indicating. Some specimens have the general color dull rufous, with the vittæ and alternate intervals less distinctly elevated.

Var. *australis*, new variety.

Larger than typical *pertinax*, with slightly longer rostrum. Surface coating more dense, ochraceous, gray-brown or cinereous. Median thoracic vitta narrower at base than at apex, in which respect it differs from *typhæ* which it greatly resembles. Third elytral intervals obsolete or interrupted. in apical half or more, fifth still shorter and more interrupted. Mesepisternum normally completely covered with coating, but becoming abraded with age.

New Orleans, La., October 26 (Soltan); "Louisiana," July 10, 1873 (C. V. Riley); Arizona (1♀ so labeled, possibly by error).

Type—No. 8220, U. S. National Museum.

Cinereous-coated individuals are from Texas (Roberts) and western Kansas (Popenoe).

The writer is disposed to consider this form as a geographical race.

Var. *typhæ*, new variety.

Of similar appearance to variety *australis*; moderately shining black, with sparser dull ochraceous coating. Thoracic vittæ less elevated, wide; median at base as wide or wider than at apex; suddenly and widely dilated just in front of middle, sometimes contiguous to the lateral. Elytral intervals with the third and fifth at least three-fourths shining black, all unelevated intervals with small elevated areas, mostly at the sides, co-

alescing with the larger elevated ones. Tibiæ densely fimbriate with long hairs.

♂.—Ventral concavity shallower than in *pertinax*, more sparsely punctate, punctures shallow along the middle; metasternum with a few minute hairs each side along posterior margin; first abdominal segment apparently without hairs.

California: Los Angeles (Koebele); Long Beach, July; S. Monica and Riverton, May 24 (Fall); Reno, Nev., July 2 (Wickham).

Type.—No. 8221, U. S. National Museum.

Reared from roots of *Typha latifolia*, September, 1886, at Los Angeles by Mr. Albert Koebele.

I have designated this form as a variety, since there is some doubt of its specific distinctness. It is certainly entitled to racial rank, or might more properly be classed as a subspecies.

***Sphenophorus abrasus*, new species.**

Form like that of *pertinax*, with which it closely agrees in many characters which will, therefore, not be repeated; color moderately shining black, with dark gray alutaceous coating, very sparse, visible on the thorax only at the sides and at middle of base and in portions of the elytral intervals. Rostrum two-thirds as long as thorax, feebly punctate even at base. Thorax, except a small strip at sides and a very small space each end of middle, which are coarsely punctate, nearly uniformly smooth, sparsely and finely punctulate; vittæ strongly confluent, nearly obsolete, surface having the appearance of being abraded. Elytral intervals alternate in width, but less in convexity, discal ones, 2, 4, and sometimes 6, more covered with elevated black areas than with gray alutaceous deposit; 7 and sometimes 6 less convex and more nearly covered with deposit. Lower surface very sparsely, finely and somewhat indistinctly punctate, scarcely more coarsely on last segment.

♂.—Ventral concavity shallow, as in *typhæ*; apex of pygidium more rounded at sides; anterior and middle femora sparsely fimbriate on inner surface; posterior femora subglabrous.

♀.—Abdominal surface very finely and sparsely punctate; pygidium with apex more narrowed, sides distinctly curved inward; anterior femora nearly glabrous, posterior glabrous; middle femora with very minute short hairs.

Length 12 mm., width 4.5 mm.

California (1 ♂, 1 ♀, Coll. Roberts).

Type.—No. 8222, U. S. National Museum. Types kindly presented by Mr. C. H. Roberts.

More nearly related to *pertinax* than to *typhæ*, and quite distinct from either by the nearly obsolete vittæ which are more strongly confluent than in extreme forms of *ludovicianus* or *maidis*.

Sphenophorus setiger, new species.

Similar to *ludovicianus*, but smaller and proportionately more robust. General color black, with cinereous or gray-brown alutaceous coating. Rostrum shorter, three-fourths to four-fifths as long as thorax, otherwise scarcely different. Elytra more nearly opaque than shining; striae more distinct; intervals unequal in width and convexity, smaller (even) intervals less developed, and variable in convexity; elevated shining black portions as follows: 2 a thin, slightly interrupted line half as long as 1; 4 a little wider and longer; 6 short or wanting; sometimes 1, 3 and 5 are the only intervals that are black. Lower surface less strongly punctate.

♂.—Rostrum a little shorter and more slender, thorax scarcely narrower anteriorly than in ♀; ventral concavity deep and broad; metasternum with a row of short brown setae just within the lateral margin, a few minute setae each side of the first abdominal segment, second with a transverse brush of longer dark ochraceous hairs. Fossa of last ventral segment of variable depth, usually more shallow than in *ludovicianus*.

♀.—Scarcely larger than the male, otherwise as in *ludovicianus*, which is true of most other obvious characters that have not been described.

Length 10.0–12.5 mm., width 4.0–5.2 mm.

Highland, N. J., July 2 (Chittenden); "N. J.;" Ithaca, N. Y. (Chittenden); Massachusetts (Ulke); Burlington, Vt. (Roberts); Coney Island, N. Y. (Roberts); "N. Y.;" Maryland and District of Columbia (Ulke); Virginia Beach, Va., July 16 (Hubbard and Schwarz); Pennsylvania; Iowa; Illinois (Ulke); "Dakota" (Ulke); Texas.

Type.—No. 8223, U. S. National Museum.

Sphenophorus ludovicianus, new species.

Of the same form as *pertinax*, but larger, with all elytral intervals black and convex. General color polished black, with a natural ochraceous alutaceous coating which covers the thoracic interspaces, elytral striae, inner surface of the tibiae, the pygidium, and the larger punctured areas.

Head finely sparsely punctulate. Rostrum the same length as, or scarcely shorter than, the thorax, slender, moderately dilated at base and at apex, moderately compressed, a little more strongly at the apex, moderately arcuate, more distinctly toward apex; surface finely punctulate, at base more coarsely and distinctly; base distinctly channeled with distinct interocular puncture, the whole forming a lanceolate depression terminating apically in a short impressed line.

Thorax a little longer than wide, strongly arcuate at the sides, moderately constricted at apex, basal half subparallel but somewhat constricted at extreme base; surface with three feebly or moderately elevated, entire, nearly smooth, broad vittae; median vitta strongly and suddenly dilated just in front of middle, the apical half forming a wide cuneiform or triangular space, basal half narrower toward base; lateral vittae nearly as wide

at basal half as the dilated portion of the median, rather feebly separated from the median by the foveate interspaces. Scutellum broadly, sometimes feebly sulcate.

Elytral striæ distinctly punctate; intervals alternating in width but equal or nearly equal in convexity, surface smooth, shining, faintly, minutely, and sparsely punctulate. Pygidium coarsely and strongly punctate, clothed with short bristly reddish hairs, becoming more dense toward the apex and forming tufts at the sides; apex truncate in both sexes.

Lower surface coarsely, sparsely punctate at the sides; second, third fourth, and anterior half of last abdominal segments faintly punctulate at middle. Legs finely punctulate.

♂.—Body more slender, thorax narrower anteriorly; rostrum more slender, just perceptibly shorter and with apex less acute. Metasternum and first abdominal segment deeply broadly concave at middle, with a long row of short brown bristly hairs each side within the concavity; second abdominal concave on the anterior portion with the more elevated portion perfectly curved and bearing at its summit a transverse brush of dark bristly hairs; last segment also concave, forming between its middle and the posterior margin a deep or moderately deep fossa, coarsely punctate interiorly and with a row of smaller punctures near the posterior margin.

♀.—Metasternum slightly concave, abdomen convex, last segment nearly flat at apex.

Length, ♂ 11–14 mm., ♀ 15–16 mm.; width 4.5–6.0 mm.

New Orleans, La., March 11, 14, October 26 (Soltau); "Louisiana;" Texas. The geographical distribution is evidently limited to the Gulf region, and the center of greatest abundance is probably in the western Gulf States near the seaboard.

Type.—No. 8224, U. S. National Museum.

Distinct from all other species of the genus on account of its longer rostrum (fig. 10, *b*), and from related species by its subequally convex elytral intervals. It is the largest North American species outside of the *equalis* group.

Say's description of *pertinax* fits this species, as well as the true *pertinax* of Olivier, but his *interstitialis* is different, nor does Horn's interpretation of Say's *interstitialis* apply, since the latter states that the body beneath is as coarsely punctured at the sides as at the middle.

Sphenophorus peninsularis, new species.

Form similar to *setiger*, but distinctly more slender. General color black and with an abundant clay-colored natural coating covering a large portion of the dorsal and ventral surfaces. It covers the apical constriction except a transverse band, narrower than the head, which joins the median vitta, also the elytra, except the humeri and anterior half of the sutural and third elytral intervals.

Rostrum fully five-sixths as long as the thorax, at apex slightly more dilated, and slightly subacutely produced on the posterior face. Thoracic vittæ about as in *setiger* but more widely separated, posterior third of median very narrow. Elytra without subapical callosity, striæ finely punctate, intervals feebly convex except anterior half of sutural and third, which are a little more prominent. Lower surface subopaque or feebly shining, faintly, rather coarsely punctate in thoracic region, more faintly in abdominal region. Natural coating completely covering the mesepisternum, metepisternum and metepimeron, sides of the metasternum and posterior portions of the abdominal segments.

Length 14 mm., width 4.8 mm.

Jacksonville, Fla. One ♀ and one imperfect specimen, a donation to the National collection by Dr. Wm. H. Ashmead.

Type.—No. 8227, U. S. National Museum.

Sphenophorus robustus Horn.

Sphenophorus robustus Horn, Proc. Am. Phil. Soc., pp. 419, 420, 1873.

Most closely allied to *setiger* and *peninsularis*, but of more robust form, and differing also by the more arcuate rostrum, which is a little more compressed and truncate at the apex with the inner or posterior angle acute. The thoracic vittæ are more elevated; median vitta distinctly dilated at middle, posterior portion broad and attaining the base, lateral vittæ slightly sinuous internally, gradually from apex to base, lateral branch feeble. Elytra finely, distinctly striate and punctate; intervals flat, subequal; surface evenly clothed with a thin cinereous or plumbeous subsericeous coating.

♂.—Ventral concavity feebly concave, nearly as coarsely punctate as at the sides.

♀.—Normal, with ventral punctures smaller and sparser.

Length 11–14 mm., width 4.5–5.5 mm.

This species ranges from Indiana and Michigan through Wisconsin, Minnesota, and western Kansas to California. It is a northern form not occurring in the East. Nothing appears to be known of its habits, references to *robustus* and its injuries to corn being due to a distinct species, my *S. maidis*.

Sphenophorus costipennis Horn.

Sphenophorus costipennis Horn, Proc. Am. Phil. Soc., p. 420, 1873.

Length, 7–12.5 mm.; width, 3–4.5 mm.

This species, with *villosiventris* eliminated, should be easily distinguished by the characters furnished in the table. The female is not so readily separated. In the structure of the rostrum these two forms exhibit a very slight difference. The average size is a little less than *pertinax*. There is considerable variation as regards dimensions and color, which, however, do

not indicate geographical races. The rostrum (fig. 10, c) is somewhat variable in contour.

The material examined shows this to be the most northern form in our fauna. It occurs commonly from the Atlantic to the Pacific, from Massachusetts through our most northern States and Ontario, Canada, to Winnipeg, Manitoba, and Kamloops, B. C.

Sphenophorus villosiventris, new species.

Form similar to *costipennis*; black with humeri, antennæ, tarsi and some other portions of the legs and of the ventral surface piceous or reddish; surface coating brownish gray, subsericeous, somewhat dense, especially on apical portion of elytra.

Rostrum perfectly straight in middle three-fifths of anterior face, apical fifth suddenly and strongly bent backward. Thoracic vittæ moderately elevated, subparallel, median little wider near middle. Scutellum deltoid, flat. Elytral striæ closely punctate; alternate intervals narrow, slightly elevated, third narrowing in posterior half, vanishing before attaining the apex, fifth striæ narrower and shorter, seventh coated, apical tubercles inconspicuous, narrow. Lower surface with very shallow punctures. Pygidium with longer hairs than in *costipennis*.

♂.—Metasterum scarcely concave, with a few scattered setæ. First ventral segment moderately concave, coarsely punctate, punctures with short setiform hairs; second abdominal finely punctate, punctures with short and finer hairs, last segment scarcely more coarsely punctate at base than second to fourth, with long hairs.

♀.—Does not appear to differ from *costipennis* by any sexual characters except those of the pygidium.

Length, 10–12 mm., width, 3.7–4.4 mm.

Buffalo, N. Y.; Ithaca, N. Y. (Chittenden); Ft. Monroe, Va. (Hubbard and Schwarz); Long Island, Massachusetts, Maryland and the District of Columbia (Ulke).

Type.—No. 8225, U. S. National Museum.

This is a most peculiar species, although to outward appearance merely *costipennis* with weakly elevated elytral intervals. It apparently combines the characters of several species, having a similar rostrum (fig. 10, e) to *lævigatus*, thoracic vittæ much as in *costipennis*, elytra between *peninsularis* and *setiger*, while the hirsute ♂ abdomen is very like that of the *æqualis* or *ochreus* group.

Sphenophorus lævigatus, new species.

Of similar form to *costipennis*, but smaller, more slender, about two-fifths as long as wide, and with elytral costæ less prominent. Color deep shining black, antennæ, tibiæ and tarsi dark piceous; alutaceous coating cinereous, very thin and sparse like a fine bloom, showing more or less dis-

tinctly between the interspaces, feebly at the apices of the elytra, on the pygidium and in the larger surface punctures, often nearly wanting.

Head moderately sparsely finely but distinctly punctulate. Rostrum three-fourths as long as the thorax, slender, strongly compressed, moderately dilated at base, a little stronger over the scrobes, gradually feebly dilated toward apex; moderately arcuate, more strongly and nearly equally on the posterior margin; on the anterior surface protuberant at basal fourth, nearly straight on middle half and more strongly curved and compressed at the apical fourth; apex rounded anteriorly, obtusely angled posteriorly; surface finely sparsely punctulate; punctures larger and stronger at base, which is deeply narrowly channeled with interocular puncture well defined.

Thorax nearly one-fourth longer than wide, moderately constricted at apex, vittæ broad, strongly elevated, entire, subparallel; lateral broadly branched; intervals coarsely, densely punctate, transversely subrugose in some individuals. Scutellum elongate, broadly concave.

Elytra deeply striate, striæ interrupted by moderately large rounded punctures, 20-24 on the first two discal striæ; intervals rather feebly alternate in width and in convexity, the first, third and fifth finely feebly punctulate, first and third biserially, fifth biserially only at base, the other intervals scarcely less elevated, also polished black, distinctly and finely uniserially punctate. Pygidium sparsely coarsely and deeply punctate, with short yellowish white hairs and with the usual apical tufts pale yellowish.

♂.—Ventral surface less coarsely punctate than in *costipennis*; prosternum sparsely punctate, last segment more coarsely. Metasternum and first ventral segment broadly feebly concave, metasternum with a few short dark brown hairs each side of the posterior margin, first ventral with a broad longitudinal row each side, converging posteriorly.

♀.—Ventral surface much more finely punctate, the punctures very fine and sparse on the prosternum and middle of the first to fourth abdominal segments.

The sexes do not differ in size or in general appearance.

Length, 10-11 mm., width, 3.6-4.2 mm.

Salt Lake City, Utah, June 14 (Hubbard and Schwarz).

Type.—No. 8230, U. S. National Museum.

Readily distinguished from *costipennis* by the nearly total absence of natural alutaceous coating, the deeply punctate, scarcely costiform elytra, pale pygidial vestiture and the larger tufted areas in the ventral concavity of the ♂.

Sphenophorus maidis, new species.

Body two-fifths as wide as long, of robust appearance because of the subquadrate thorax which is nearly as wide as the elytra; general color black or piceous, moderately shining; alutaceous deposit on unelevated surfaces

inconspicuous, appearing to be normally dark rufous or piceous velvety when the extraneous argillaceous covering does not persist.

Rostrum three-fifths the length of the thorax, considerably arcuate, strongly subequally compressed, apex prolonged at the posterior angle with an acute spine, producing the appearance of greater curvature of the inner surface, base feebly protuberant, moderately dilated; anterior face of apex broadly deeply concave; surface minutely punctate, more distinctly and densely at base, base moderately deeply channeled with distinct deep interocular puncture and short impressed line.

Thorax longer than wide, fully three-fourths as long as the elytra, sides usually widest just in front of middle, anterior third suddenly and very strongly arcuate and constricted at apex, posterior two-thirds or three-fourths subparallel, or gradually narrowing to the base which is feebly bisinuate. Vittæ feebly elevated, tending toward obsolescence, moderately finely but distinctly and sparsely punctate, more coarsely and densely at the ends; median vitta extending from a fine line and rapidly widening to a point just in front of the middle where it is broadly dilated, then more abruptly narrowed, extending in a narrower line to near the base; lateral vittæ sinuous with a tendency to become confluent with the median in the apical half, generally a little wider in basal half but narrower than the median, branch wide but ill-defined; interspaces and surface at sides coarsely foveate-punctate, punctures becoming confluent, especially posteriorly at sides. Scutellum deeply broadly concave.

Elytra little wider than the thorax; striæ usually deep and well defined, distinctly closely punctate; intervals with first, third and fifth elevated, with two or more series of rows of fine punctulation; first or sutural with basal third triseriately, posterior two-thirds biseriately punctulate; third widest and most elevated, with four or five rows of fine punctulations; fifth biseriately punctulate; seventh little or not at all more elevated than the remaining intervals; intervals 2, 4, 6, 8, as also 7, more coarsely and closely uniseriately punctulate. Pygidium deeply, coarsely and rather sparsely punctate, with sparse golden yellow hairs proceeding from the punctures and forming a short tuft each side, frequently abraded.

Lower surface coarsely and rather densely punctate, scarcely less strongly at the middle than at the sides, punctures largest at the middle of the metathorax. Punctures of the metepisterna (side pieces) more or less confluent. Second, third and fourth abdominal segments nearly uniformly punctured throughout, like the legs.

♂.—First abdominal segment very feebly concave; pygidium truncate at apex.

♀.—First ventral scarcely different; pygidium narrowed and rounded at apex.

Aside from the differently shaped pygidium and the slightly shorter and less compressed rostrum there is little difference between the sexes.

Length, 10–15 mm., width, 4.5–6.0 mm.

Augusta, Kansas (E. L. Williams); Riley Co., Kans. (P. J. Parrott); Florence, Kans.; Dadeville, Ala. (S. M. Robertson); Wetumka, Ala. (F. S. Earle); Columbia, S. C. (L. O. Howard); Ballentine, S. C. (J. Duncan); Texas (Ulke, 1 ex.); "Mich." (Knaus).

Type.—No. 8226, U. S. National Museum.

A very injurious species, destructive to corn in both larval and adult stages in the localities given, except Texas and Michigan.

Owing to the somewhat general confusion of *maidis* with *robustus* and *pertinax*, especially in economic literature, it has been included in the table of the *pertinax* group, although it possesses quite obvious characters which might justify its removal to a class by itself. Viewed from the dorsal surface, it bears a greater resemblance to *scoparius* than to any other species. The rostrum (fig. 10, *d*) is unique in this group. In a natural arrangement the last mentioned species would follow together with *cariosus*, each constituting a distinct group.

There are two singular species which so greatly resemble others of the *pertinax* group that they may properly be described in this paper, although in reality they do not, on account of their tarsal characters, fall in the same class. A third form, which displays no affinity to any other group completes the list of descriptions.

UNCLASSIFIED SPECIES.

Sphenophorus incongruus, new species.

Superficial appearance of *costipennis*, more slender, black with light ochreous coating, covering thoracic interspaces, elytra except three intervals and four callosities, the larger punctures on sides, and the mesepimera.

Rostrum two-thirds the length of the thorax, moderately arcuate and compressed, a little more strongly at basal and apical fourths, anterior face of apex flat, posterior face suddenly bent forward, interocular puncture distinctly rounded, producing a strongly obtuse angle.

Thorax one-fourth longer than wide, posterior two-thirds subparallel. Vittæ polished black, narrow, moderately elevated, continuous, subparallel; median slightly dilated in front of middle; lateral as wide in basal half as median where dilated, at which point they are narrow with strong curvature on the medial (?) side, branch feebly indicated. Interspaces wide. Scutellum polished, deeply concave.

Elytral striae very thin, with small punctures remotely placed. Intervals 3 and 5 and sutural half of 1 moderately shining, feebly elevated in apical half or more, 1 with a single row of fine closely placed punctures

along the suture, 3 and 5 either uni- or bi-seriately punctulate, humeral and subapical callosities well marked, the latter long.

Ventral surface sparsely foveate-punctate, coarsest on metasternum, sparse and finer on first, still finer on second to fourth ventral segments.

♂.—Pygidium truncate, ventral concavity moderately shallow.

♀.—Pygidium a little more narrowed to apex, which is moderately rounded.

Length, 9–11 mm., width, 3.3–3.8 mm.

Wisconsin (1♂, coll. Roberts); Maryland (1♂, 1♀, coll. Ulke.)

Type.—No. 8228, U. S. National Museum. Mr. Ulke's specimens are in the Carnegie Museum, Pittsburg, Pa. The Wisconsin example has been kindly given to the National Museum by Mr. C. H. Roberts.

In some purely superficial characters there is great resemblance between this species and *costipennis*, and *villosiventris*, but the singular construction of the rostrum precludes its classification with those species, while the tarsal structure prevents its being placed in the *pertinax* group. The third joints of all the tarsi are very little wider than the first. The club of the antenna is wide, the funicular joints very narrow, and the pedicel is very wide and rounded. The antennal structure of preceding species is radically different, the club and pedicel being comparatively smaller and the funicular joints larger, thus preventing their being grouped together.

Sphenophorus robustior, new species.

Of similar appearance to *robustus* but still more robust, and shorter, with shorter rostrum and less elevated vittæ. Black with much gray coating above.

Rostrum three-fourths the length of thorax, strongly subequally compressed, bent backward in apical third where it gradually enlarges to the apex, which bears a small, moderately deep, rounded concavity, posterior face at apex subobtuse. Base rather broad, with interocular puncture usually not clearly defined.

Thorax with vittæ feebly elevated, somewhat coarsely and densely punctate; median not attaining base, lateral with lateral branch variable. Scutellum smaller than in *robustus*. Elytra deeply striate, finely punctate; intervals 3 and 5 wider, remainder subequal in width; 1 strongly elevated, 3 and sometimes 5 slightly elevated and black apically. Intervals 1, 3, 5 and 7 biseriately punctulate except at base, remainder uniseriately and a little more coarsely and not so closely punctulate.

♂.—Pygidium pentagonal, with pale gold hairs scarcely extending out of the punctures. Lateral tufts minute. Lower surface moderately coarsely punctate; ventral concavity moderate.

♀.—Pygidium narrow, rounded at apex; punctures deeper, hairs scarcely visible; lower surface more finely punctate than in *robustus*.

Length, 10–11.5 mm., width, 4.5–4.8 mm.

Cook Co., Ill.; “Ills.” (Forbes and Hart).

Type.—No. 8229, U. S. National Museum. Types kindly presented by Messrs. Forbes and Hart. Cotypes in collection of Illinois State Laboratory of Natural History.

This species has been compared with *robustus* merely because of the superficial resemblance of the two. As a matter of fact the two species do not belong to the same group. The coarse punctation of the vittæ and the finer punctation of the elytra alone would distinguish them even without the peculiar tarsal structure, which is similar to *incongruus*.

Sphenophorus pontederiæ, new species.

Form similar to *venatus*, about one-third as wide as long, general color dull black without alutaceous coating.

Rostrum four-fifths the length of the thorax, slender, nearly perfectly cylindrical, moderately dilated at base, a little more above the scrobes, dilated portion rounded, moderately rather narrowly canaliculate, interocular puncture rounded, usually deep; surface somewhat sparsely and finely punctulate except basal portion. Head sparsely punctulate, nearly smooth.

Thorax longer than wide, moderately arcuate, gradually narrower to the apex, apical constriction not strong; disc densely coarsely and very deeply punctate, the punctures frequently confluent. Vittæ broad shining, feebly elevated, and finely sparsely punctate; median vitta bifurcate inclosing an apical fossa and extending in a faint line through fossa but not attaining the base of the thorax, broadly dilated at and in front of the middle; lateral vittæ extending from the forked portion of the median vitta with which they are confluent and curving around the expanded portion of the median vitta to basal margin of thorax, being partially interrupted at apical third. Scutellum polished, moderately concave.

Elytral surface somewhat unequal, finely striate, striæ moderately coarsely punctate, punctures gradually finer to apex; intervals nearly flat, distinctly or slightly alternating in width and scarcely in convexity, very finely uniseriately punctulate. Pygidium coarsely punctate, hairs golden yellow, comparatively long, particularly about the apex where they extend beyond the lateral tufts.

Lower surface coarsely and densely foveate-punctate, nearly uniform at sides and middle, punctures largest, becoming confluent on the metasternum, also on last segment where they form a small fossa at apex; first and second abdominal segment divided by a faint sutural line. Legs long, finely sparsely punctate.

♂.—Metasternum and first abdominal segment feebly and narrowly concave at middle, second ventral very feebly. Pygidium feebly rounded at apex.

♀.—Metasternum nearly flat. Pygidium a little more distinctly rounded at apex.

Length, 9–11 mm., width, 3.5–4.4 mm.

New Orleans, La. (H. Soltau, R. W. Shufeldt); "Louisiana"; St. Lucie, Fla., and Savannah, Ga. (Hubbard and Schwarz); Texas (1 ex.)

Reared August, 1883, by Mr. Albert Koebele from larvæ found on the roots of pickerel-weed (*Pontederia cordata*) in July.

Type.—No. 7907, U. S. National Museum.

A single example, from New Orleans, has the punctured surface of the dorsum, a considerable portion of the lower surface of the thorax and small irregular areas on the abdomen coated with a shining ochreous integument like that of *æqualis*.

A very distinct species, showing no apparent affinity to any other form. From *venatus* or "*placidus*," with which it has been confounded in many collections, it may be distinguished by its naked body; long, cylindrical rostrum; with rounded apex; longer legs; more narrowed thorax; broader thoracic vittæ; divided apical fossa, and ventral punctuation as well as sexual characters. The tarsal structure is very similar to that of the *venatus* group.

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PROCEEDINGS
OF THE
ENTOMOLOGICAL SOCIETY
OF WASHINGTON.

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The 192d regular meeting was held at the residence of Mr. C. L. Marlatt, No. 1440 Massachusetts Avenue, N.W., President Banks in the chair and Messrs. Ashmead, Barber, Burke, Busck, Couden, Currie, Fairchild, Fiske, Girault, Hinds, Hopkins, Marlatt, Patten, Schwarz, Stiles, Ulke, and Webb, members, and Messrs. Brues, Hooker, Lantz, Nawa, Pierce, Sasser, and Sanders, visitors, present.

The president appointed, as the new publication committee, Messrs. Currie, Schwarz, Ashmead, Titus, Busck, Barber, and Heidemann.


Dr. H. G. Dyar was elected to represent the Entomological Society as a Vice-President of the Washington Academy of Sciences.

The treasurer presented his report to the society.

The resignations of Mr. T. Wayland Vaughan from active membership and of Prof. B. E. Fernow from corresponding membership were presented and accepted.

Mr. W. Dwight Pierce of the Bureau of Entomology, U. S. Department of Agriculture, was elected an active member of the Society.

The Annual Address of the retiring president was then read by the Recording Secretary;



ANNUAL ADDRESS OF THE PRESIDENT.*

THE LINNÆAN GENERA OF DIPTERA.

BY D. W. COQUILLETT.

To the systematic entomologist the writings of Linné possess an interest not shared by those of any other author. Coming at a time when pure science was being freed from fiction, he did yeoman service in the direction of placing the science of Natural History upon a firm foundation. This is particularly true in regard to the classification of natural history objects, and it is interesting to trace the evolution of this classification as given in the various authorized editions of his immortal *Systema Naturæ* and of his *Fauna Suecica*. Of the thirteen editions of the former work only five were issued by the consent and under the supervision of Linné himself; these are the first, second, sixth, tenth and twelfth editions. The other eight are reprints and usually abridged, the exception being the thirteenth edition, which contains considerable additional matter contributed by Gmelin, who edited it.

In the editions by Linné the various objects are divided into classes, orders, genera and species. The separation of the orders into families was at that time unknown.

The first edition of the *Systema Naturæ*, which appeared in the year 1735, treated the insects as class five and divided them into four orders; COLEOPTERA, which contained the Coleoptera as at present understood, together with the Orthopterous genus *Forficula*; ANGIOPTERA, comprising the Lepidoptera, Neuropteroid insects, Hymenoptera excepting the ants, Diptera and the *Toredo*; HEMIPTERA, comprising the Orthopterous genus *Gryllus*, the modern order Hemiptera, and the scorpions; finally the APTERA, which included all the wingless forms, now placed in four different orders, and some of the crustacea. The Diptera are comprised in the single genus *Musca*, which is briefly described, and under it are ranged, as species, *Musca* (different species not named), *Æstrum veterinum*, *Æstrum lapponicum*, *Tabanus*, *Culex*, *Tipula*, *Toredo navalis*, and the ant-lion.

In the second edition, published in 1740, the same four orders are recognized, but the name of one of them, Angioptera, is here changed to GYMNAPTERA. The Diptera are arranged as in the first edition except that only four species are listed, namely, *Musca*, *Tabanus*, *Culex* and *Æstrum*, while after each is given its vulgar or common German name.

The first edition of the *Fauna Suecica* appeared in the year 1746. In this work no less than seven orders of insects are recognized, the names of four of them appearing for the first time, namely, NEUROPTERA, LEPIDOPTERA, HYMENOPTERA, and DIPTERA. The names, Angioptera, of the first edition of the *Systema Naturæ*, and Gymnaptera, of the second edition, are dropped entirely in the present work, while the other previously proposed names Coleoptera, Hemiptera, and Aptera, are retained, but in a restricted sense. In the Diptera the number of genera have increased from the one, given in the first and second editions of the *Systema*, to seven, namely; *Æstrus*, *Asilus*, *Hippobosca*, *Tabanus*, *Musca*, *Culex*, and *Tipula*. This work marks a very great advance in the matter of classification, especially in regard to genera and species. The genera are not described, but the species are characterized at considerable length, although not named specifically.

The next, or sixth, edition of the *Systema Naturæ* appeared in the year 1748, and is practically a repetition of the preceding work, but with the descriptions of the species omitted. The genera, however, are briefly described.

The tenth edition was published in 1758. Here the binomial system of nomenclature is given in its more perfected form, each species having a separate name. The orders are as in the sixth edition. In the Diptera three new genera are added, namely, *Empis*, *Conops*, and *Bombylius*.

The second and last edition of the *Fauna Suecica* appeared in 1761; the orders in the insects and the genera in the Diptera are the same as given in the tenth edition of the *Systema Naturæ*.

The twelfth and last authorized edition of the *Systema Naturæ* was published in two parts; the insects are comprised in the second part, which bears the date of 1767. The orders and genera of the Diptera are the same as in the tenth edition.

It will thus be seen that two of these works mark very important epochs in the classification of insects; these are, the first edition of the *Fauna Suecica*, wherein the seven much more natural orders of insects are instituted and many new genera founded; and the tenth edition of the *Systema Naturæ*, in which the binomial system of nomenclature is placed upon a firm basis.

A few words in regard to the real name of this great naturalist may not be out of place. Students of his published writings have been sorely puzzled over the fact that whenever he had occasion to sign his name, whether in the dedication of the volume or at the end of the preface, he at first wrote his name Linnæus, but in his later works it appears as "von Linné." Historians inform us that the grandfather on the paternal side was a peasant by the name of Tiliander, and that his son, the father of the naturalist, in accordance with the custom then prevailing in Sweden, changed his name to Linnæus at the time he entered the University, and his son also used this name until the year 1761, when the King of Sweden issued to him a patent of nobility under the title of Carl von Linné—a curious admixture of German and French. It will thus be seen that Linnæus was not his academic or assumed name, as some have supposed, but was his legitimate name, inherited from his father, and that it was later changed to von Linné by royal decree.

Turning now from a consideration of one whose work comprised the entire realm of nature, it may not be out of place here to call attention to a recent important event in the history of an organization whose object has been to investigate only one of the numerous branches of Natural History. In view of the fact that the year just passed marks the twentieth anniversary of the founding of our Society, a brief retrospect of its history and work may be of some interest to the members and others interested in its welfare.

The Society took its inception on Friday evening, February 29th, 1884, in response to a call signed by Messrs. C. V. Riley, E. A. Schwarz, and L. O. Howard. At the following meeting,

held in the evening of March 12th, a constitution was adopted, officers were elected, and the names of twenty-six persons enrolled as charter members. Of these twenty-six original members, nine have passed into the great beyond, while eight of the others have since abandoned the study of Entomology, leaving only nine of the original twenty-six members still in the ranks, namely: Lawrence Bruner, T. L. Casey, Otto Heidemann, L. O. Howard, Albert Koebele, Theodore Pergande, E. A. Schwarz, J. B. Smith, and P. R. Uhler. It is fervently to be hoped that many years will pass by before this list will be lessened by a single name!

During the twenty-one years of its existence our Society has elected ten presidents, and while our constitution is silent on the subject it seems early to have become an unwritten law that the officers elected for any particular year were to be re-elected for the succeeding year. This rule was followed with a single exception; by an apparent oversight there is no recorded election of officers for the year 1897; those chosen for the previous year simply held their offices until their successors were elected and qualified. Up to and including the year above mentioned the presidents had held office for the prescribed two years each and had prepared an annual address at the close of each term, but during the following three years this rule was destined to be ruthlessly broken. The late lamented H. G. Hubbard was elected president of the Society for the year 1898, but ill-health prevented him from attending the meetings and preparing an annual address; he was re-elected president for the following year, but passed away before a month of the new year had elapsed. From the date of his demise on January 18th until the 16th of the following May the Society had no president, but at the latter date the first Vice-President, Doctor Theodore Gill, was elected president for the balance of the unexpired term. At the next annual election all of the officers were re-elected for the year 1900. During this year, as also the portion of the preceding one subsequent to the month of May, the Society was without a first vice-president. This break in the usual course of events resulted in our having two presidents during

the three years 1898-1900, while no annual address was delivered for either of these years. Each of the other presidents held office for two consecutive years, and one of them, Dr. Riley, the first president, was especially honored by the Society in that it elected him its president at four different times—an honor never since conferred upon any of its members.

During the twenty years of its existence our Society has published six volumes of its Proceedings; three of these appeared during the first eleven years, and the other three during the remaining nine years. These volumes are veritable storehouses of biological facts and also contain much matter of special interest to the student of systematic entomology, attesting the wide-awake interest and unremitting efforts of the members.

Mr. Fairchild exhibited a collection of photographic reproductions of the portraits of famous botanists, published by Prof. Wittrock of Sweden. He called especial attention to a series of portraits of Linné at different ages, the first one taken when about 30 years of age and ending with a copy of a reproduction in wax taken at an advanced age.

Mr. Schwarz, referring to Linnæus, mentioned a published bibliography of the latter which is very little known or referred to. This is the one by Dr. C. A. Dohrn, President of the Entomological Society of Stettin, published in the *Stettin Entomologische Zeitung*.

Dr. Stiles spoke in favor of the formation by the Washington Entomological Society of a collection of photographs of its members. He believed that this should be begun at once, since it would soon be difficult, if not impossible, to secure photographs of the older members, and the collection would very soon come to be highly prized. After some discussion Dr. Stiles's suggestion in the form of a motion was seconded and carried.

—Dr. Hopkins read the following paper:

NOTES ON SOME MEXICAN SCOLYTIDÆ, WITH DESCRIPTIONS OF SOME NEW SPECIES.

BY A. D. HOPKINS.

(In Charge of Forest Insect Investigations,
Bureau of Entomology, U. S. Dept. Agr.)

Chapuis (1869), Eichhoff (1868-'79), and Blandford (1885-1904), have described several hundred species of Scolytids from Central America and Mexico, but there has been comparatively little recorded regarding their habits. Recently some information has been contributed in this line in an article by Prof. A. L. Herrera (El Progreso de Mexico, June 8, 1903) on a bark beetle injuring the white mulberry, and by Dr. S. J. Bonansea (in a pamphlet entitled "Birds and Insects," published by the Agricultural Society of Mexico, 1904), in which reference is made to extensive depredations by bark beetles on the pine forests in different sections of Mexico. The references to Scolytidæ in both of these papers were based on preliminary identifications of species sent to the Bureau of Entomology by the authors. Considerable additional Mexican material has been received from Prof. Herrera, Dr. Bonansea, and Mr. E. Baumann. In response to a request from Dr. Bonansea for names and descriptions of new species, and further information in regard to the named ones, this paper is presented, in order that he may include them in his forthcoming report on investigations of the causes of dying timber in Mexico.

The Scolytidæ received from these gentlemen represent nine genera and sixteen species, of which ten appear to be undescribed. Descriptions of these, with notes on other species from Mexico and their allies in the United States, follow:

Platypus rugulosus Chap. Three females and one male, Michoacan, Mexico, in wood of "chocolate tree," received from Prof. Herrera. This is a common and widely distributed species in Central America and Mexico, and probably extends into the southern border of the United States. One specimen in our collection from California appears to be different although closely allied.

Platypus pini, n. sp. Male type, length 5 mm.; very elongate cylindrical, piceous; legs and antennæ lighter reddish. Head, prominent, nearly one-third as long and slightly broader than anterior width of prothorax; front broad, flat, opaque, pubescent and punctured, but the punctures are very shallow, of irregular size and often contiguous; the occiput

convex, with two broad, opaque, slightly impressed longitudinal spaces each side of a slightly elevated, smooth, shining median one, the remaining surface towards the eyes shining, sparsely punctured and with a few long, backward-curved hairs. Prothorax subopaque, as long as the basal width, narrower in front and deeply excavated in the sides for the anterior legs; distinctly punctured, denser each side of a faint, median, dorsal, smooth space and coarser near the anterior and posterior margins; posterior third with distinct impressed dorsal line; base bisinuate. Elytra, subopaque; base elevated and with a subacute margin; striæ faintly impressed, narrow, shining, and with faint, shallow punctures; the interspaces subconvex, equally elevated towards the middle, not punctured except those on the sides, which have a row of very fine obscure ones; the declivity is darker, opaque, with shallow, shining punctures faintly evident; the third interspace is strongly elevated, carinate, with an acute apex and extending to the middle of the face of the declivity; five and seven are slightly elevated and acute but not extending much beyond the vertex; the apical process is divided into two distinct triangular teeth, outer one longer; the apex is deeply, obtusely emarginate; the first interspace is not distinctly tuberculate on the vertex.

♂ *Type*.—No. 7509 U. S. Nat. Mus., Chaleo, Mexico, October, 1903, in pine. Received from A. L. Herrera, under his number 873.

This is closely allied to a common (but undescribed) species which infests the pines in Arizona.

Gnathotrichus nitidifrons n. sp. Female type, length 2.8 mm.; elongate, cylindrical, brownish; head and ventral portion black; the legs reddish. Head broad, slightly convex, shining, and punctured each side of a broad smooth median space, which extends from the anterior margin to near the vertex; pubescence fine and sparse; eyes large, emarginate; antenna club with two nearly straight indistinct sutures on the anterior face and with a few scattering long hairs. Prothorax more than half as long as elytra; posterior two-thirds with sides parallel; anterior third with sides and anterior margin broadly rounded, the latter faintly roughened with broad serrations; anterior half sparsely pubescent, finely asperate, the asperities coarser towards anterior margin and much finer and denser towards the vertex and sides; posterior half glabrous, opaque, finely indistinctly punctured. Elytra glabrous, except on declivity, which bears a few long hairs; striæ not impressed, indistinct, faintly punctured; interspaces flat, faintly rugose; declivity with interspaces one and two slightly impressed and with slight elevation armed with a row of minute granules each side towards the vertex, while towards apex interspace one is slightly elevated and the others flattened and faintly rugose; the sides are not strongly rounded but narrowed towards the apex, giving it a slightly produced appearance.

♀ *Type*.—No. 7510 U. S. Nat. Mus., Michoacan, Mexico, in pine, Prof. A. L. Herrera, collector, bearing his number 1047.

This is allied to the common Eastern United States species *G. materiarius* Fitch, which infests the wood of pines from Maine to Florida and Texas, and *Picea* from Maine to the higher mountains of North Carolina. The Mexican species is distinct from *materiarius* by the broad, smooth, shining frontal space and the much more distinctly produced apex of the elytra.

Gnathotrichus sulcatus Lec. One specimen, Chaleo, Mexico, October, 1903, received from Prof. Herrera under his number 872, and another specimen from Michoacan, in pine, under his number 1047. I fail to find characters of sufficient value to separate these specimens from *G. sulcatus* Lec., which I have found to be a good species and not the male of *G. retusus* Lec., as considered by LeConte (Proc. Amer. Philos. Soc. XV, p. 350). *G. sulcatus* is a common and widely distributed species in the Pacific Coast and Rocky Mountain regions. I have found it in *Pinus*, *Tsuga*, *Pseudotsuga*, *Abies*, *Picea*, *Thuja*, and *Sequoia*. Blandford evidently had specimens of this species, together with (as he himself suggests) representations of one or two other species when he drew up his descriptions of *G. consentaneus*.

Pityophthorus chalcænsis n. sp. Female type, length 2.6 mm.; elongate, cylindrical, dark, ferruginous; sides of prothorax and legs lighter. Head broad, flat, rather coarsely, densely, rugosely punctured and with epistoma-like elevation on the anterior margin; the face with a few scattering hairs and the margin fringed with long incurved yellow ones; eyes emarginate; antennal club small and sutures impressed on sides and face. Prothorax one-half as long as elytra; sides nearly parallel to anterior third, then narrowed to margin which is broadly rounded; nearly smooth; anterior rugosities confused, extending towards side margin; posterior half shining, with median smooth longitudinal space; punctures coarser and denser towards dorsal space, fine and sparse on sides; pubescence fine, sparse, recumbent. Elytra twice as long as prothorax; pubescence fine and sparse towards base, denser and longer on declivity; striae punctures in approximate rows on sides, confused towards suture, side margin and declivity; second interspace broadly, deeply impressed; the sutural interspaces elevated and roughened with a row of numerous acute granules; the third interspace rather strongly elevated and armed with a row of six or seven small, acute piliferous, granules; striae one and two obscure.

♀ *Type*.—No. 7511 U. S. Nat. Mus., Chaleo, Mexico,

October, 1903, in pine, from A. L. Herrera, under his number 872.

This species is not closely allied to any known species north of Mexico, and apparently is quite different from any of the nineteen species recognized from Central America and Mexico by Blandford.

Pityophthorus herrerae n. sp. Female type, length 2.5 mm.; elongate, cylindrical, piceous. Head broad, flat, finely rugosely punctured; pubescent and fringed with long, yellow hairs; the anterior margin with a smooth shining triangular elevation; eyes emarginate; antennæ missing. Prothorax slightly more than half as long as elytra, slightly narrowed from base to anterior margin, which is broadly rounded, faintly roughened, but not serrate; anterior rugosities confused, extending toward side margin, where they are much finer; posterior half with distinct longitudinal space, broader towards base, not elevated; punctures rather coarse and dense, becoming very fine towards the sides, but without interstitial minute points; anterior half and sides with fine sparse pubescence; posterior dorsal surface glabrous. Elytra pubescent only towards side margin and on declivity; stria punctures irregular but in approximate rows the interspace towards the suture and side margin with an occasional puncture; declivity with sutural interspaces slightly elevated and roughened with a few small irregular granules; apex slightly produced; the second interspace broad, flat, shining; the third scarcely elevated, punctured, but without distinct granules; the first stria is close to the first interspace, faintly impressed and punctured; the second stria is close to the third interspace, distinctly punctured.

Male type, length 2.55 mm.; differs from the female in the glabrous, shining, evenly punctured front, with strongly elevated, smooth, shining posterior margin, and a faintly elevated, shining lateral margin; antennæ yellowish-red, club with two slightly curved sutures, basal joint glabrous, shining; prothorax with anterior rugosities coarser; posterior half with broader dorsal space; elytra pubescent only along sides towards the margin, pubescence denser and longer on the sides of the declivity, but the vertex and face of the declivity are glabrous; the sutural and third interspaces more distinctly elevated and roughened with coarser granules.

♀ *Type*.—No. 7512 U. S. Nat. Mus., Mexico, from A. L. Herrera, under his number 696.

♂ *Type*.—No. 7512 U. S. Nat. Mus., from A. L. Herrera, under his number 694. One additional female with number 696 is smaller, 2.25 mm., but agrees exactly in other characters.

This appears to come close to *P. confusus*, Bland., but differs in the smooth punctation of the prothorax instead of "interstitial punctation of minute points" mentioned in the description of *confusus*.

Tomicus mexicanus n. sp. Female type, length 4.8 mm.; elongate, cylindrical, ferruginous, clothed with long fine hairs; declivity of elytra excavated and armed each side with three teeth, the first very small, acute—the second triangular, acute—the third widely separated, long, cylindrical and thickened toward tip. Head, front flat, subopaque, densely granulated with shining median impression and a small shining tubercle on the anterior margin; antennal club with two obscure, broadly curved sutures on the anterior face; the posterior face pubescent and with one indistinct broadly curved suture. Prothorax as broad as long; anterior two-thirds roughened with small asperities, becoming finer towards the sides; posterior third smooth, punctured, with narrow dorsal longitudinal space. Elytral punctures coarse, those of the striae coarser and denser than those of the interspaces, first to fourth in distinct row, but the punctures on the sides are densely confused.

Male type, length 5 mm., same form and general characters as the female, except that the pubescence is less dense; the frontal impression deeper and opaque, the marginal tubercle more prominent, and the margin more distinctly granulated; the teeth of the declivity distinctly coarser, especially the first and second.

♀ and ♂ Types.—No. 7513 U. S. Nat. Mus., Mexico City, Mexico, 1903, in firewood, Prof. A. L. Herrera, collector, and bearing his number 865.

Two additional males from the same lot are of the same size and color of the female type, and agree exactly with the secondary sexual characters in the male.

This is evidently the species mentioned by Blandford (Biol. Centr. Amer., Vol. IV, Part 6, page 188), on the authority of Eichhoff, under *T. concinnus* Mann. It is, however, easily distinguished from specimens I have identified as *concinnus* by its reddish color and very much coarser puncture of the elytra and prothorax. Blandford compared his specimens with one from California, which, although closely allied to *concinnus*, evidently represents an undescribed species. *T. concinnus* is a boreal form extending down the coast into the United States with the Sitka spruce, in which it lives, while the California species is common in *Pinus radiata* in middle California and *Pinus murrayana* of the higher Sierras and extending, with this tree, as far north as Priest Lake, Idaho.

Tomicus integer Eichh. The specimens in our collection from Mexico received from Mr. Blandford under *T. plastographus* belong, without doubt, to *T. integer* Eichh., which is a good species, distinct from *T. plastographus* Lec., with which it has been confused. The type specimen of the latter which I have examined agrees with specimens from Monterey pine in California, but LeConte made the mistake in this, as he

did in many other cases, of including in his revision in the *Rhynchophora* characters of specimens other than the original type or types. There was only one specimen on which the original description was based, but in LeConte's revision a specimen from New Mexico was included which proves to be *T. integer* Eichh.

I have found *T. integer* to be a very common species throughout the Rocky Mountain region, from Montana east to the Black Hills of South Dakota, and south to New Mexico and Arizona, from which it extends into Mexico. It infests *Pinus ponderosa* and *Pinus monticola*, but no evidence has been found that it is a primarily destructive enemy. *T. plastographus* Lec., seems to be confined entirely to the sections in California where *P. radiata* grows.

Tomicus bonanseai n. sp. Female type, length 3.35 mm.; elongate cylindrical, dark reddish-brown. Prothorax slightly darker; declivity of elytra excavated and armed each side with four short acute teeth, the first smaller, and the second to fourth nearly of equal size, but the second and third are closer together and situated on a slight elevation of the margin. Head flat, opaque, densely granulated, clothed with short erect pubescence and with fine median elevated line from middle to anterior margin; antennæ missing. Prothorax as long as broad, sparsely pubescent towards sides to anterior margin; posterior half rather coarsely sparsely punctured, with smooth, shining dorsal space; sides parallel to anterior third, then strongly narrowed to apex. Elytra less than twice as long as prothorax, with short sparse pubescence towards the side margin and declivity; striæ faintly impressed, punctures distinct and closely placed, slightly coarser towards the middle; interspace one narrow, two and three broad, flat and not punctured towards base, fourth to ninth sparsely punctured.

Male type, length 3.35 mm.; yellowish-red (young example), differs from female in the narrower, more convex and more shining front, with the granules and punctures less distinct and with a more prominent subcarinate tubercle towards the middle; prothoracic punctures finer and less dense. Elytral striæ and interspaces the same, but the teeth of the declivity are much coarser—the first and fourth of equal size, acute; the second stout, triangular, with acute point at right angles to the third tooth, which is cylindrical, prominent and enlarged towards the apex. The antennal club is slightly oblong, with two sutures on the anterior face; the first straight and the second bisinuate, and posterior face is glabrous, shining, and without sutures.

♀ *Type*.—No. 7514 U. S. Nat. Mus., Tacubaya, Mexico, in pine, Dr. S. J. Bonanseai collector, bearing his number 2.

♂ *Type*.—No. 7514 U. S. Nat. Mus., Prof. A. L. Herrera, collector, bearing his number 694.

This species belongs to the *T. pini* division of the genus, characterized by four marginal teeth on each side of the elytral declivity. Evidently it was not represented in material seen by Eichhoff and Blandford. It is readily recognized from *Tomicus integer* Eichh., by its much smaller size, and from *T. oregoni* Eichh. and other allied North American species, which might find their way into Mexico, by its more slender form.

Tomicus cribripennis Eichh. Four females and four males, Mexico, in pine, received from Dr. Bonansea. This species is a representative of the section of the genus characterized by five teeth on the side margin of the elytral declivity, and also with the interspaces of the elytra punctured. This section is represented in the United States by *Tomicus confusus* Lec., which I have found to be a common and sometimes destructive enemy of the piñon (*P. edulis* in Arizona, and *P. monophylla* in Southern California); also by an undescribed species from Idaho and Montana, in *Pinus monticola*.

The Mexican species differs from *T. grandicollis* Eichh. of the Eastern United States (which also has five teeth on the declivity) in the distinct punctures of the elytral interspaces. Blandford states that the specimens seen by him differ from the type in being smaller and less robust, which is the difference from *confusus* observed in the specimens before me.

Phlæophthorus moriperda n. sp. Female type, length 1.65 mm.; stout, cylindrical, reddish-brown; head, prothorax and ventral surface darker. Elytra, legs and antennal scape reddish. Head subconvex, subopaque, finely granulated and with very fine, short, sparse pubescence, and with a fine, median longitudinal elevated line on the slightly flattened and more shining anterior half; eyes oblong, oval, not emarginate; antennal scape with a few long hairs; club large with three triangular segments separated by two impressed slightly oblique sutures. Prothorax one-third broader than long, one-half as long as elytra, slightly narrowed from base to front, the anterior margin not serrate; surface opaque, clothed with reclining, stout, yellow pubescence and roughened by sparsely placed granules, which are coarser towards the sides. Elytra shining, the base elevated and serrate; the side margins serrate from middle to apex; serrations much coarser on the side margins of the declivity; striæ impressed; punctures distinct to vertex; interspaces faintly elevated and roughened with a row of asperities and each with a row of fine, yellowish hairs from base to apex; declivity convex; striæ deep and narrow, but the punctures obscure; interspaces convex, and with a row of small acute granules.

Male type, length 1.85 mm.; same form and color as female but with the head narrower and deeply concave, shining; the sides elevated and

with an acute tubercle towards the base of the antenna and faint broken transverse ridge across the front between the tubercles; the anterior margin with a small shining apical tubercle; the scape of the antenna distinctly fringed; the granules of the interspaces of the declivity are coarser on the vertex and face.

♀ and ♂ Types.—No. 7515 U. S. Nat. Mus., Irapuato, Mexico, in white mulberry, H. Chambon collector, but received from Prof. Herrera.

Three females and two males of the same lot vary in length from 1.65 to 2.1 mm., but otherwise show very little variation from the types.

Three specimens were received through Dr. Erwin F. Smith, from Prof. Herrera, who, as stated in his published account, received them from Mr. Hipolite Chambon, with the statement that it had killed more than one thousand small white mulberry trees in Irapuato, Mexico. This species differs from any of those mentioned by Blandford under *Phlæotribus*, but belongs to his division characterized by the club of the antenna, which is not twice as broad as long. This is a character common to the species of the well defined genus *Phlæophthorus* which is represented in the United States by *P. frontalis* and its allies, and in Europe by *P. rhododactylus*. The Mexican species comes closer to our mulberry bark beetle *P. frontalis*, but is distinct from it by its smaller size, brown club of the antenna, the prothorax more opaque, smoother, and the elytra more shining.

Phlæosinus tacubayæ n. sp. Female type, length 2.4 mm.; body stout, piceous, with elytral declivity more reddish; pubescence short, stout, intermixed with scales on declivity. Head with front convex, finely granulated, granules becoming sparser towards middle; with fine carina from middle to anterior margin and finely densely punctured on vertex; eyes oblique, deeply emarginate; antennæ missing, but in another specimen the club is oblong, with first and second sutures on anterior face nearly straight and the third strongly curved; the sutures are the same on the posterior face, but the first joint is very much shorter. Prothorax much broader than long; sides rounded from base to apex, faintly constricted towards anterior margin; surface shining, smooth, rather densely punctured, without dorsal line or space. Elytra twice as long as prothorax, and slightly broader; basal margin serrate, produced forward but not elevated; striæ narrow, with contiguous elongate punctures; interspaces flat, irregularly rugose; declivity convex; first and third interspaces serrate; second narrow, convex, punctured.

Male type, length 2.4 mm.; differs from female in its narrower front, with a faint median impression and in the declivity of the elytra, which is more shining and less pubescent.

♀ and ♂ *Types*.—No. 7516 U. S. Nat. Mus., Tacubaya, D. F., Mexico, in Cupressus, E. Baumann collector, February, 1903.

One additional male and two females from same lot show no difference except that the front of the males has a much more distinct elevated line from middle to anterior margin.

This species and the following belong to the division of the genus characterized by a smooth second interspace of the elytral declivity of the females. The species of this genus infest *Juniperus*, *Cupressus*, *Chamaecyparis*, *Taxodium*, *Sequoia*, and their allies, and, under certain conditions, may be destructive.

Phloeosinus baumanni n. sp. Female type, length 3.5 mm.; body stout; prothorax, ventral surface and legs black, elytra more reddish; pubescence yellowish, short, dense on front of head and prothorax, sparse and in approximate rows on elytra; the declivity clothed with fine, short scales. Head, front convex, rugose, with faint impression and faint, elevated line from margin to vertex, slightly broken by impression; eyes oblong; antennal club large, oblong, with three oblique broadly curved sutures on anterior face and three nearly transverse curved ones on the posterior face. Prothorax, one-third broader than long, narrowed from base to apex; sides rounded, faintly constricted anteriorly; punctures dense, coarser towards sides. Elytra slightly more than twice as long as prothorax; base subacute, produced forward, slightly elevated and serrate; striae scarcely impressed but with very coarse distinctly separated punctures; the interspaces narrow, scarcely elevated but roughened with rather coarse transverse rugosities which often extend across the striae between the punctures; declivity convex, with interspaces one and three strongly elevated and closely serrate, the second interspace nearly flat and densely subrugosely punctured.

Male type, length 4.1 mm.; same color and form as female, except that the prothorax is narrower anteriorly; the front is narrow, flat or subconcave, with median elevated line from middle to anterior margin; the elytral interspaces are smoother and the striae punctures more distinct, the declivity steep, with the first interspace broad, flat, shining and irregularly punctured, with two or three teeth on the vertex; the first stria is distinct, strongly punctured and broadly curved towards the side, almost obscuring the second interspace and stria; the third interspace is prominently elevated and serrate, with coarse, closely placed teeth.

♀ and ♂ *Types*.—No. 7517 U. S. Nat. Mus., Tacubaya, D. F., Mexico, in Cupressus, E. Baumann collector, February, 1903.

Fifteen females and nine males in same lot vary in length from 3.9 mm. to 4.1 mm.—average about 4 mm.

Dendroctonus mexicanus n. sp. Female type, length 4 mm.; elongate, cylindrical, dark brown. Head broad, with two frontal elevations separated by a shallow median groove; anterior and posterior halves punctured; middle rugose from eyes to frontal elevation; antennal club broad, compressed towards tip, and with two broadly curved sutures. Prothorax nearly as long as broad, slightly narrowed from base to anterior margin, which is sinuate, the base declivous and bisinuate; punctures moderately coarse, becoming finer towards sides; anterior third with distinct transverse ridge extending across proepisternum. Elytra twice as long as prothorax; sides parallel; base obliquely serrate; interspaces roughened with asperities, which are coarser towards base and vertex; the first interspace with a row of coarser asperities from near base to vertex; declivity subconvex, sparsely clothed with long erect hairs which also extend to near the middle of the elytra; the striae narrow, punctures obscure; interspaces flattened and roughened with irregular granules.

Male type, length 4 mm.; differs from female in the more prominent tuberculate frontal elevations separated by a deeper groove. Prothorax with transverse ridge across the anterior third less distinct than in the female and not extending across the proepisternum. Elytra with deeper striae and more convex interspaces.

♀ and ♂ Types.—No. 7518 U. S. Nat. Mus., Sacramento, Amecameca, Mexico, in pine, A. L. Herrera collector.

Twenty-five females and eleven males received at different times from A. L. Herrera and Dr. S. J. Bonansea, from Amecameca, Michoacan and Tacubaya, Mexico, vary in length from 3 mm. to 4 mm.—average about 3.8 mm.

The characters described in the types are fairly constant in all the specimens, but the submarginal ridge is more distinct in some females than in others, and, while present in some males, it is obscure or absent in others.

This species belongs to the division of the genus characterized by more prominent frontal tubercles in the male and a transverse ridge near the anterior margin of the prothorax of the female. It finds its nearest ally in *D. parallelocollis* Chap. of Mexico, and *D. frontalis* Zimm. of the Eastern and Southern States. It is, however, easily separated from *parallelocollis* by the uniform smaller size and more brownish color, and is distinct from *D. frontalis*, with which the smaller examples agree in color and size, by the much longer and coarser hairs of the elytral declivity, the rugosities coarser towards the base and declivity, and a row of coarse granules on the first elytral interspace. This is evidently the species most to blame for the destruction of the pine forests in Mexico, and evidently has habits very similar to that of *D. frontalis*, which devastated the pine and spruce forests of the Virginias in 1891 and 1892,

as described in Bulletin No. 56, West Virginia Agricultural Experiment Station.

Dendroctonus parallelocollis Chap. Ten specimens received from Prof. Herrera, taken from dying pine trees in Michoacan and other localities in Mexico. This is evidently the same as *D. approximatus* Dietz, which name is more recent, but may be used for the variety found as a common enemy of the pine in Arizona and New Mexico. Specimens of this variety are distinguished from those before me from Mexico only by the much shorter pubescence and hairs on the sides of the prothorax towards and on the basal angle. All the species of *Dendroctonus* are exceedingly variable, and when a large series of specimens of allied forms are examined it is very difficult to separate them by any constant characters.

Dendroctonus valens Lec. Four specimens, Michoacan, Mexico in pine, received from Prof. Herrera. These are typical examples of the large red *Dendroctonus* heretofore identified as *D. terebrans* Oliv., which latter is a black form restricted to the Eastern and Southern United States, while *D. valens* is widely distributed over the Eastern as well as the Western United States and is a common enemy of all of the pines, and occasionally found in spruce. It breeds in the living bark at the base of healthy trees or that of stumps of recently felled ones. I have found that a large per cent. of the so-called basal fire wounds of the Western yellow pine is primarily due to the work of this species. Very little evidence has been found, however, of trees having been killed by it.

Hylurgops planirostris Chap. One specimen, Mexico City, 1903, in firewood, received from Prof. Herrera, under his number 865. This species was recorded by Blandford from several localities in Mexico and Guatemala. It is, as he says, allied to *H. rugipennis* Mann., which I have found to be common in *Picea*, *Pinus* and occasionally in *Abies* and *Pseudotsuga* from Northwestern Washington to the Black Hills of South Dakota, and south to Monterey, California and Williams, Arizona. The Mexican species is easily separated from *rugipennis*, however, by the obscure punctures and fine rugosities of the prothorax. Blandford included *H. planirostris* in the genus *Hylastes*, but it seems to me that *Hylurgops* is sufficiently characterized by the deeply bilobed third tarsal joint and other characters to justify retaining it for this and several European and American species.

Mr. Schwarz stated that the life-history of the remarkable Mexican Scolytid genus *Chapuisia* has been published by

Dr. Eugene Duges, and there may be other scattering notes on Mexican Scolytidæ. He suggested that the Scolytidæ collected at Brownsville, Texas, last summer by Mr. Barber be worked up and incorporated by Dr. Hopkins in his paper, since they were in reality Mexican Scolytid species.

—Mr. Barber, under the heading of Short Notes and Exhibition of Specimens, showed several original photographs of the work of the tube-forming termite (*Termes tubiformans*) at Brownsville, Texas, and described the termites' work. This species, by covering large areas of grass and herbage with its clay or earthen galleries, destroys and kills much of the pasturage and is thus of considerable economic importance. Each blade, stem or twig is completely incrustated and portions of the ground where these termites are abundant thus presents a very singular appearance.

Mr. Brues stated that *T. tubiformans* is common at Austin, Texas, and that it feeds there upon cow manure. Mr. Fairchild asked Mr. Schwarz whether any truly fungus-cultivating termites were known in this country. Mr. Schwarz replied that he did not know of the habit of fungus-cultivating in any of our species.

—Mr. Banks showed a small piece of limestone rock in which were many minute holes, each of which was occupied by a mite of the family Oribatidæ, genus Scutovertex. This was one of many spray-covered stones taken from the banks of a stream of water near Ithaca, N. Y. The mite appears to have no special peculiarities, but is a new species and closely related to one found on boulders between tide-marks on the northern Atlantic coast. Inasmuch as each mite, be it large or small, fits its hole, it seems evident that the holes are caused by the mites themselves; yet he could offer no explanation or supposition as to how this is done.

—Mr. Marlatt then introduced to the Society Mr. K. Nawa, of Gifu, Japan, and expressed for the latter his pleasure at being able to visit Washington and attend a meeting of the Entomological Society.

FEBRUARY 2, 1905.

The 193d regular meeting was held at the residence of Dr. L. O. Howard, 2026 Hillyer Place, N.W., Vice-President Hopkins in the chair and Messrs. Alwood, Ashmead, Barber, Benton, Burke, Cook, Currie, Doolittle, Dyar, Fairchild, Fiske, Girault, Hinds, Howard, Hunter, Marlatt, Morrill, Morris, Pierce, Quaintance, Schwarz, Scott, Titus, and Webb, members, and Messrs. Beattie, Crawford, Hooker, Norton, Rankin, Sanders, and Sasscer, visitors, present.

Dr. Dyar showed a specimen of the larva of *Castnia licus* Drury which has been received at the Bureau of Entomology as injurious to sugar cane in British Guiana, by boring in the stems. Very little is known about the larvæ of the Castnidæ except that they are borers. This has led some to infer that there is a relationship between them and the boring Hesperiidæ such as *Megathymus yuccæ*, but such should not be the case, as the venation is entirely different in these groups. The larva before us bears out this conclusion, as it is a true Tineoid form, not related to the Butterflies, but to the Cossidæ and Sesiidæ.

LARVA OF CASTNIA LICUS Drury.

BY HARRISON G. DYAR.

Larva. Head large, rounded, full, somewhat flattened, apex retracted in joint 2; clypeus small, shield-shaped, but with large paraclypeal pieces which touch the vertical membrane; antennæ very small, rudimentary, shorter than the palpi; ocelli, nearly obsolete, two small ones seen near the antennæ; brownish luteous, darker around the mouth, the mandibles and articulations black. Body robust, cylindrical; thorax enlarged, especially the dorsal parts of joints 3 and 4; joint 5 small, both dorsally and laterally; joints 6 to 10 about equal, 11 and 12 a little smaller. Spiracles large, narrowly elliptical, the one on joint 12 largest and directed obliquely backward. Thoracic feet very short, almost rudimentary, projecting laterally. Abdominal feet on joints 7 to 10 distinctly elevated but without the ordinary hooks. They are covered with numerous minute spicules, not in rows but in a large patch which narrowly runs across between the feet. These spicules are present also on the ventral side of joints 3 and 4 and dorsally on joints 3 to 11. On joints 7 to

10 dorsally they are placed in an elliptical, slightly raised area divided by a groove, so that the larva may almost be said to have feet on its back. No spines on joint 13. Shields reduced, the cervical shield large, scarcely chitinous except in a number of irregular brown patches; a slight linear thickening of the cuticle on the posterior edges of joints 3 and 4; anal flap large but uncornified. Skin smooth, yellowish white, unmarked. Tubercles very small, setæ minute. Arrangement normal for the Tineoidea without secondary hairs of any kind. On the thorax i and ii remotely approximate in pairs, iii very small, iv rather large, v below it, vi single on the leg base; on the abdomen i dorsad to ii, remote, ii opposite the edge of the spined area, iii above the spiracle, iv and v approximate, superposed on the upper subventral fold, vi posteriorly on the leg base, vii of three setæ on the anterior leg base, two of them weak and apparently sometimes absent, viii on the inner side of the leg.

—The Recording Secretary exhibited for Mr. A. N. Caudell a copy of the first volume of Kirby's Synonymic Catalogue of Orthoptera, containing the Forficulidæ, Hemimeridæ, Blättidæ, Mantidæ, and Phasmidæ, and presented for Mr. Caudell the following notes:

KIRBY'S CATALOGUE OF ORTHOPTERA.

BY A. N. CAUDELL.

Through the kindness of the author I have just received from the British Museum a copy of the first volume of Kirby's Synonymic Catalogue of Orthoptera. This volume contains the families Forficulidæ, Hemimeridæ, Blättidæ, Mantidæ, and Phasmidæ. The saltatorial families will appear in a second volume.

The general arrangement of this catalogue is the same as that of the Neuroptera, Libellulidæ, Lepidoptera Heterocera, and Lepidoptera Rhaplocera by the same author. This catalogue forms a volume of over 500 pages, is well printed and well bound and the reputation of the author as an orthopterist is a guarantee of the excellency of the contents. However, as is invariably the case of any undertaking of considerable magnitude, there are certain omissions and errors that have crept in. I now desire to correct a few points that I believe to be erroneous, note a few omissions known to me, as well as to offer criticisms on a few points in which I am unable to agree with the author. With one or two exceptions the

following remarks apply only to genera or species found in our own country.

Labidura riparia Pall. The habitat of this species should include localities in the new world. The variety *erythrocephala*, however, is recorded from the West Indies and the author may refer all the new world specimens to that form.

Anisolabis annulipes Luc. *A. bormansi* Scudd., *azteca* Dohrn and probably also *antennata* Kirby should have been quoted as synonyms of this species. Bormans placed *antennata* as synonymous with *azteca*, *bormansi* was established as synonymous with *annulipes* by McNeill, and I have shown *azteca* and *bormansi* to be synonymous. However these are opinions and each worker is at liberty to follow his own belief.

Sphingolabis taeniata Dohrn. *S. linearis* Eschscholtz is quite certainly the same as this and has priority by some years and should take precedence.

Ischnoptera uhleriana Sauss. *I. unicolor* and *lithophila* of Scudder are both synonyms of *uhleriana*, so admitted by their describer.

Temnopteryx virginica Sauss. This is listed as distinct though it has been proved by breeding that it is the female of *Ischnoptera uhleriana*.

Phyllodromia Serv. Though Mr. Kirby knew this to be preoccupied he still uses it as valid, citing *Blattella* and *Liosilpha* as synonyms. This is done, however, as he wrote me, because of lack of time to determine whether *Liosilpha* or *Blattella* should be used in the place of it. The probability is that they may both be retained, depending upon whether or not *germanica* and *pumicata*, their respective types, are congeneric.

Phyllodromia germanica Linn. *Blatta obliquata* Dold. and *Ischnoptera bivittata* Thom. should be placed as synonyms of this species. Instead, the former is omitted altogether and the latter is listed as a distinct species.

Phyllodromia bivittata Serv. I very much doubt the distinctness of this species. It is certainly no more than a variety of *germanica*.

Phyllodromia borealis Sauss. This is, according to Blatchley, the female of *Isch. pennsylvanica* Deg.

Temnopteryx marginata Scudd. This species, which is also a synonym of *I. pennsylvanica*, is omitted from the catalogue.

Temnopteryx major Sauss. This belongs to the genus *Ischnoptera*.

Loboptera americana Scudd. The original reference is wrongly given, the correct citation being Proc. Davenp. Acad. Nat. Sc., viii, p. 93, pl. ii, fig. 4 (1899).

Pelmatosilpha floridana Walk. Under this species, or at least in the same genus, should come the *Platyzosteira sabaliana* of Scudder, which Kirby locates in the genus *Eurycotis* as a synonym of Walker's *semipicta*. Having the types of both *floridana* and *semipicta* he should be able to properly place them, but Mr. Kirby is surely wrong in generically separating their supposed synonyms *ingens* and *sabaliana*, which are certainly congeneric if not synonymous.*

Tenodera sinensis Linn. This should have North America included in the habitat. It is the type of the newly established genus *Paratenodera*.

Mantis religiosa Linn. Like the above this should have North America included in the habitat.

Stagmomantis carolina Linn. *S. ferox* Sauss., *dimidiata* Sauss., *wheeleri* Thom., and *tolteca* Sauss. should be placed as synonyms of *carolina*.

Oligonyx scudderi Sauss. *O. bollianus* S. & Z., and *Mantis missouriensis* Glover are synonyms of this species. Instead the former is listed as distinct and the latter is omitted from the catalogue.

Thespertia graminis Scudd. This is certainly not congeneric with *Oligonyx scudderi*, though here placed in the same genus with it.

Pseudosermyle Caud. Though I especially mentioned *P. banksi* as the type when I established this genus Mr. Kirby gives *arbuscula* as the type.

Timema Scudd. This remarkable genus is certainly worthy of subfamily distinction, but Mr. Kirby includes it in the Anisomorphinæ, making no reference to Timeminæ, the subfamily proposed for it.

Aplopus Gray. Kirby uses the amended spelling *Haplopus* and gives *jamaicensis* as the type. But the genus is monotypical, *micropterus* being the only species included under it at the time of its establishment. Therefore, *micropterus* and not *jamaicensis* is the type.

Mr. Kirby retains certain species as valid that I should consider as invalidated through preoccupation. Such, as an example, is *Phoraspis cossidea* Dalm., 1823, described as *Blatta cossidea* and, in my opinion, is preoccupied by *Monastria cossidea* Esch., 1822, also described in the genus *Blatta*.

Appended I give a list of genera and species of Blattidæ apparently not entered in the catalogue. All are described prior to 1896. Some of them may be entered under a misspell-

* Since the above was written, I have proved these forms synonymous by breeding.

ing, as, for example, *Mioblatta fornicata* Sauss., which is entered as *forficata*, throwing it alphabetically from its rightful position and rendering it not readily found in the index. The same is true of *Blatta adversa* Sauss. & Zehn., which is misspelled *advina*.

One paper by J. G. O. Tepper, Tr. Royal Soc., S. Austr., xix, 1895, is apparently unknown to the cataloguer, since none of the contents are entered. This paper contains one new genus and three new species as follows:

Phyllodromia magna, page 19.

Paratemnopteryx zietzii, page 20.

Lepidophora n. gen., page 20.

Lepidophora furcata, page 21.

The following genera and species I cannot find in the catalogue, though they are apparently eligible to entry.

Blatta acutipennis Serv., Hist. Orth., 91 (1839).

Blatta abdomen-nigrum DeGeer, Hist. Ins., iii, 538, pl. xlv, fig. 5 (1773).

Blatta rufa DeGeer, id.

Epilampra conspicua Walk., Cat. Blatt. Brit. Mus., 67 (1868).

Hys Gistel, n. gen., Naturg. des Thierr., 137 (1848).

Hys cruentatus Gistel, id.

Blatta punctata Gistel, id.

Blatta decorata Serv., Hist. Orth., 99 (1839).

Pseudophyllodromia hystrix Sauss., Rev. Zool., xxi, 110 (1869).

Blatta incisa Walk., Cat. Blatt. Brit. Mus., 109 (1868).

Periplaneta parva Tepp., Tr. Royal Soc. S. Austr., xix, 162 (1895).

Periplaneta jungii Tepp., id.

Phyllodromia Fieber, Lotos, iii, 93 (1853).

Blatta pumila Stal, Eug. Resa, 309 (1858).

Epilampra rustica Stal, Öfv. Ak. Forh., xxxiv, No. 10, 34 (1877).

Heterogamia spinipes Fisch., Ent. de la Russ., iv, 74 (1846).

Heterogamia punctata Fisch. id.

Both *spinipes* and *punctata* are mentioned by Fieber, Lotos, iii, 95 (1853), as equaling *Blatta ægyptica* Linn.

Blatta lineolata Dalm., Anal. Ent., 87 (1823).

Macrophyllodromia Sauss. & Zehn., Biol. Cent.-Amer., Orth., i, 46 (1893).

Temnopteryx marginata Scudd., Rept. U. S. Geol. Surv. Nebr., 251 (1872). This is a synonym of *Ischnoptera pennsylvanica*.

Blatta domicola ———, Risso Hist., v, 210 (———); Fieber, Lotos, iii, 94 (1853).

Blatta asellus Thunb., Mem. l'Acad. Imp. Sc. St. Petersb., x, 227 (1826).

Blatta cinerea Thunb., id., p. 277=*Blatta rufa* DeGeer.

Blatta cylindrica Thunb., id., p. 279.

Blatta gibba Thunb., id., p. 279.

Blatta limbata Thunb., id., p. 278.

Blatta papillosa Thunb., id., p. 275.

Some of these species of Thunberg's may not be blattids, but *B. cinerea* certainly is, for he refers to DeGeer's figure in the description.

The following species, all referred to before 1800 and after 1758, I do not find in the catalogue. Some of them may not be Blattidæ. All the references have been verified except those preceded by an asterisk.

Blatta alba Ström., Nye Saml. K. Danske Skrifter, ii, 66 (1783).

**Blatta anelytra* Schranck, Beytr. Naturg., 73 (1776).

**Blatta daurica* Beckm. Laxmann's Sibir. Briefe, 48 (1769).

**Blatta heteroceros* Licht., Cat. Rerum. Nat., iii, 95 (1796). (MS. name very probably.)

**Blatta ingens* Licht., Cat. Rerum Nat., iii, 95 (1796). (MS. name very probably.)

**Blatta longicornis* Licht., Cat. Rerum Nat., iii, 95 (1796). (MS. name very probably.)

Blatta longipalpi Fabr., Ent. Syst., Supp., 185 (1798).

Blatta palliata Fabr., Ent. Syst., Supp., 186 (1798).

Blatta reticulata Fabr., Ent. Syst., Supp., 186 (1798).

Blatta obliquata Daldorf, Skr. Nat. Selsk., ii (2), 164 (1793). This according to the describer equals *Blatta germanica* Linn.

Blatta ocellata Gmelin, Linn. Syst. Nat., xiii, i, 2047 (1789).

Blatta punctulata Gmelin, id.

Ocellata and *punctulata* have the reference "Mus. Sesk., p. 47, Nos. 7 & 8.

Blatta ruficollis Fabr., Mant. Ins., i, 226 (1787).

**Blatta transfuga* Brünnich, in Pontoppidan's Kurzg. Nachr. Naturhist. Dannemark, 212 (1765).

Mr. Burke exhibited specimens, drawings and different stages in the work of the various insects which cause the "black check" of the western hemlock (*Tsuga heterophylla*). The primary injury is made by a member of the family Scolytidæ, the hemlock barkbeetle (*Hylesinus* sp.), while the real injury to the lumber is caused by a rat-tailed maggot, the

larva of the Syrphid fly *Cheilisia alaskensis* Hunter. This larva enters the wound made by the bark-beetle and causes the discoloration of the wood known as "black check." Mr. Burke showed, also, *Hylesinus granulatus* LeConte, which causes the primary injury to the lowland fir (*Abies grandis*), and another Syrphid fly, *Cheilisia hoodianus* Bigot, whose larva follows up the work of *H. granulatus* as does the larva of *Cheilisia alaskensis* that of the hemlock barkbeetle. Mr. Burke showed, further, *Syrphoctonus maculifrons* Cresson, an Ichneumonid parasite of both species of *Cheilisia*, and *Eutelus flavipes* Walker, another parasite of *Cheilisia alaskensis*, belonging to the family Pteromalidæ. In conclusion he exhibited specimens of the family Byrrhidæ, viz., *Amphicyrte simplicipes* Mann., found on resin masses exuding from fir and hemlock injured in the manner described, and *Simplocaria nitida* Mots., found on resin masses on injured hemlock. The exact relation of these two beetles to the *Cheilisia* and *Hylesinus* and their work is still undetermined.

Mr. Schwarz stated that the Byrrhid beetles live in moss and that their presence in resin is only accidental.

—Mr. Cook presented some notes on the habits of the kelep, or Guatemalan cotton-boll-weevil ant (*Ectatomma tuberculatum* Ol.). He found, in the case of this ant, that new colonies are formed by parties of workers from older communities and by transfer of a queen from the old to the new colony. When moving a colony, the workers first transfer the eggs, then the larvæ, then the cocoons. Then the queen is seized by her mandibles and carried over. In some ants belonging to this family (Poneridæ) the queens never have wings. In the kelep, however, wings are present, although they are probably never used. The keleps have no mating flight and the wings of queens are not bitten off regularly or promptly as are those of other ants. In view of these marked peculiarities of habit Mr. Cook affirmed his agreement with Dr. Ashmead that the Poneridæ are allied to the Dorylidæ and Mutillidæ rather than to the true ants which have an annual mating concourse.

—Dr. Morrill exhibited two specimens of the Mexican

flower beetle, *Euphoria basalis* G. & P., stating that he found the species on cotton blooms at Gomez Palacio, in the Laguna district of Northern Mexico, and at Cuernavaca. The beetle was very common at both places and to a certain extent injurious. He frequently found two beetles in a single cotton bloom, and in one case four. Published records show the occurrence of this beetle only in Mexico and there only in the plateau region—not in tropical portions, apparently. Dr. Morrill, however, called attention to the fact that Gomez Palacio has an elevation of only 2,700 feet, while Cuernavaca, seven degrees of latitude further south, is about 5,000 feet above sea level, thus showing that the species really has quite a geographical as well as vertical range. The specimen shown from Gomez Palacio is large, with dull yellow markings, and the hundreds of specimens observed at that place were of about the same size and color. The specimen from Cuernavaca, on the other hand, is smaller, with markings of a more intense yellow, and is typical of the many observed there. Dr. Morrill stated that there were fourteen specimens of this species in the National Museum collection all labelled "Mexico," without other information concerning locality. No two of these specimens are alike and they present gradations in color and size between the specimen from Gomez Palacio and the one from Cuernavaca.

—Mr. Fiske presented the following paper:

CATOGENUS RUFUS,

A Coleopterous Parasite.

BY W. F. FISKE.

During the summer of 1903, a single specimen of this beetle was bred from the cocoon of a Hymenopterous (Braconid) parasite of the Elm Borer (*Saperda tridentata*), but subsequent examination of the cocoon failed to determine definitely whether the beetle had developed on the parasite itself or whether it had entered the empty cocoon and there pupated. The former theory was believed to be the true one, but could not be proven. During 1904 three specimens were bred under circumstances which cannot be construed otherwise than to amply confirm it.

April 13, 1904, a Cerambycid pupa of an unknown species (allied to *Goes*, and possibly *Goes oculata*) was found in a small chestnut which had died the previous summer.

On April 16 this was carefully examined and described, and on the following day, another careful examination discovered a very minute larva attached to the ventral surface of the abdomen, which was at first supposed to be that of a Hymenopterous parasite, but subsequently found to be Coleopterous. This larva, which was extremely minute and hardly visible without the aid of a lens, was believed to have hatched during the day intervening between the two examinations. It was attached by its head only (a faint dark colored spot soon appearing upon the body of the host at that point), and its body projected at an angle from that of its host.

For several days it remained in this position, increasing slowly in size, until the 19th, when it was found to have relaxed its hold, and was removed to a freshly pupated *Callidium aereum*, in the hope that the wound already inflicted on its host might not necessarily be fatal. Careful examination showed that this pupa was slightly wounded on one of its tarsi shortly after the introduction of the parasite, but the latter could not be observed to feed until May 8, when it was found to have moulted. The new host at this date was still alive, as was also the pupa upon which the parasite was originally found.

May 10 it was feeding freely and growing rapidly, and the new host appeared to be dead.

May 20 it had completely destroyed its host, and no trace of cast skin to indicate that it had moulted again could be found. It was then resting quiescent, and remained so until June 3, when it pupated. The pupa was entirely unchanged June 16, but July 3 was found to have produced a perfect *Catogenus rufus*.

On April 13, and on the same tree as that from which the above mentioned specimen was taken, a cocoon of one of the well-known parasites of the Cerambycidae, *Bracon dorsatus*, Say, was collected and placed under observation. July 5, on examination, a second specimen of *Catogenus rufus* was discovered, plainly visible through the parchment-like walls, and careful examination failed to discover any visible aperture by which any larva might have entered. This specimen was considerably below average size, while that bred from the Cerambycid pupa was, though much smaller than some specimens, about an average between the largest and the smallest.

A third specimen was afterward reared under still more interesting circumstances, and serves to confirm its life-history as above set forth.

April 26, 1904, a cocoon containing a larva of the same species of Hymenopterous parasite above mentioned was taken in the same tree from which the earlier collections were made, and placed in a breeding vial. June 3 the parasite was noted as having pupated, and very nearly reached maturity, but beside it, plainly visible through the transparent walls of the cocoon, was noticed a small white larva, supposed at that time to be that of a hyperparasite. This pupated soon after, and on July 9 was found to have just emerged; a very small specimen of *Catogenus rufus*.

The larva of the beetle appears, therefore, to be a true external parasite, its habits differing in no essential feature from those of many species of external Hymenopterous parasites.

The adult is fairly common throughout the South, and is found beneath the loose bark of recently dead and dying trees, both coniferous and deciduous. It occurs at nearly all seasons of the year, but is especially common during the late fall and early spring, and is found hibernating in situations similar to the above mentioned.

—Dr. Dyar then presented the following paper:

A FEW NOTES ON THE STRECKER COLLECTION.

BY HARRISON G. DYAR.

The Strecker collection is well preserved at Reading, Pa., just as Dr. Strecker left it. All the types are clearly marked and are without any admixture of foreign species. Dr. Strecker had an excellent eye for species and hardly ever redescribed anything that he had in his collection. The ascertainable synonyms, therefore, are not very many; I put a few on record here.

Family NOCTUIDÆ.

I could not form any judgment on most of the Noctuid types without being able to take them away for comparison with other collections. The species described under *Schinia* fall both into *Schinia* and *Lygranthæcia* on the character of the inner claws on the fore tibiæ as follows—*Lygranthæcia*: *imperspicua*, *dolosa*, *hanga*, *ultima*, *inclara*, *fastidiosa*, *nubila*, *siren*, and *lora*. *Schinia*: *lanul*, *obscurata*, *tanena*, *ar*, *labe*, *rubiginosa*, *approximata*, and *neglecta*.

Schinia ochreifascia Smith is not a synonym of *lanul*, but an entirely distinct species; *velaris* Grote has also been referred to the synonymy, but I do not know about it.

Family THYATIRIDÆ.

Euthyatira tema Streck. (3183) is *E. semicircularis* Grt. (3181).

Family PLATYPTERYGIDÆ.

Dryopteris adona Streck. (3228) is a good species which I do not have, resembling *D. irrorata* Pack., but much larger, the fore wings without the prominence on outer margin, the hind wings long and somewhat produced.

Family GEOMETRIDÆ.

Tephroclystis golgata Streck. (3311) appears to be a *Glaucina* near *escaria* Grt. (3819). The fore tibia has a claw; but I was afraid to injure the type in looking for a fovea. It is a single ♀.

Philereme optimata Streck. (3346) is *Coryphista badiaria* Hy. Edw. (3339).

Hydriomene banavahrata Streck. (3397) is a varietal form of *H. californiata* Pack. (3391).

Hydriomene elisata Streck. (3415) is *Zenophleps lignicolorata* Pack. (3366) with a wrong locality label. It is marked "North Carolina" which I presume is a misreading of an abbreviated label that originally stood for "Northern California."

Petrophora anticostiata Streck. (3462) is *P. convallaria* Gn. (3460).

Macaria lapitaria Streck. (3683) appears to be the same as *Sciagraphia sublacteolaria* Hulst (3643).

Macaria teucaria Streck. (3684). I have the species from Seattle, Wash. (Johnson), Yosemite, Cal., June 16, 1891 (Dyar), and Sedalia, Col., June 15, 1901 (Dyar & Caudell). My California specimens are labelled *M. respersata* by Dr. Hulst, but I think it distinct therefrom by the different color.

Diastictis marinaria Streck. (3713). This is a faded specimen of *Eucrostis viridipennata* Hulst (3569). The species fades very easily and becomes quite uncharacteristic.

Apæcasia mercedulata Streck. (3756) appears to be a form of *Deilinea falcataria* Pack. (3629).

Platea demorsaria Streck. (3775) is *Spodolepis substriaria* Hulst (3804).

Selidosema excelsarium Streck. (3840). A large and well marked species. I have it from Seattle, Wash., and Wellington, B. C. It has been correctly identified by Rev. Geo. W. Taylor.

Lychnosea runcinaria Streck. (3894) is only a variety of *L. helviolaria* Hulst (3892) with the edge scarcely empurpled.

Therina fautaria Streck. (3905) is *T. endropiaria* G. & R. (3908), worn and with the lines unusually approximate. I have such a specimen from Maine.

Euchlæna amethystaria Streck. (3959). I cannot separate it from *Gonodontis hypochraria* H.-S. (3941).

Priocyclus jucundaria Streck. (3992) appears to me an aberrational form of *P. armantaria* H.-S. (3990).

Sabulodes nonangulata Streck. (4021) is probably only a variety of *S. caberata* Gn. (4020).

Family COCHLIDIIDÆ.

Kronæa minuta Reak. The types should be in the Strecker collection; a specimen of the European *Heterogenea asella* is so labelled, but of course incorrectly.

The following paper was then read by title:

DESCRIPTIONS OF NEW AMERICAN SPIDERS.

BY NATHAN BANKS.

In the following pages are descriptions of some sixteen new spiders from various parts of our country, most of them from the far West. They are presented now as I wish to have them in a catalogue of our spiders which is now about ready for publication. Among them are three genera new to the United States.

Modisimus texanus, n. sp.

Cephalothorax pale yellowish, with a broad, median, black stripe, tapering a little behind, eyes on black spots, but the middle of the eye-tubercle is pale, two black stripes from eyes down upon clypeus, and fainter on mandibles; legs pale, femora with from 6 to 12 brown marks below, near apex forming rings, the last preapical and broader than others, a mark over articulation of patella and tibia, and a preapical band on tibia brown. Sternum brown, pale in middle, abdomen pale, with many black and white spots above and behind, leaving a pale median stripe and a line each side; venter pale, with a median black dot. Eyes upon a considerable elevation, almost as high as length of mandibles; A. M. E. practically wanting. Legs very slender, femur i over four times as long as cephalothorax; abdomen high, subglobose, rather pointed at spinnerets; epigynum projecting forward in a sharp point.

Length 2.7 mm.

Austin, Texas, March, kindly given me by Prof. J. H. Comstock.

Avicularia californica n. sp.

Cephalothorax densely clothed with yellowish-gray hair, rather paler on sides and brighter in the middle; on anterior margin is a fringe overhanging the mandibles of long, pale gray hairs with tawny tips; eye tubercle with some long, partly recurved, bristles on middle. their bases tawny, and their tips pale. The mandibles are densely clothed above, with yellowish-gray appressed hair, and long, procurved bristles, whose bases are tawny, and tips pale. Sternum and coxæ black, with short fine grayish hair, and long, erect, partly tawny bristles. Legs densely clothed with yellowish-gray hair, and long, procurved bristles, except above on the femora, where there are only a few bristles near tip; the under sides of the legs are darker than upper side; and there is a dense black scopula beneath metatarsi and tarsi; there are two or three spines beneath on metatarsus iv toward base. Abdomen clothed above with fine dark brown hair, and many long, recurved bristles of a tawny color with pale tips; venter black-haired, and with long tawny bristles, especially noticeable on the posterior sides. Maxillæ and fang-grooves with long tawny bristles.

Length of cephalothorax, 28 mm.; width 16 mm.

Several specimens from the vicinity of San Diego, California.

Cybæus minutus n. sp.

Entirely dull yellowish, the cephalothorax and legs rather brighter than the abdomen; eyes on black spots. Cephalothorax not very slender; posterior eye-row a trifle recurved, P. M. E. more than diameter apart, and scarcely farther from equal P. S. E., anterior eye-row almost recurved; A. M. E. small, and about diameter apart, and closer to larger A. S. E., S. E. separate by radius; quadrangle of M. E. much narrower in front. Mandibles not strongly geniculate. Legs of moderate length, 4-4 spines under tibiæ i and ii; sternum rather broad; metatarsi i not scopulate. Abdomen short and broad; epigynum reddish, swollen, showing beneath a cavity in each posterior side.

Length 3.5 mm.

One female from Olympia, Washington. Distinguished by small size, and pale color.

Argyrodes pluto n. sp.

Deep jet black, except a few glittering patches of yellowish near summit of abdomen; an oblique spot each side, two transverse dots above before apex, and a semicircle partly around apex. Abdomen higher than long, not projecting beyond spinnerets, but very high directly over spinnerets and ending in a rather sharp point, the posterior margin (seen from side) and the dorsal margin slightly convex. The abdomen (seen from above) is rather broad in middle, more so than in most species. The first legs are long, but scarcely as long proportionately as in *A. trigonum*.

Length 4 mm.; abdomen high, 2.8 mm.: tibia i, 2 mm.

One female taken near Falls Church, Va., 23 June, 1904, in web of a *Lathrodectes mactans*; *A. trigonum* in the same web. It is our largest eastern species of the genus, and very distinct by nearly uniform black color.

Dipæna tibialis n. sp.

Cephalothorax blackish, black on eye region; mandibles and palpi pale yellowish; legs reddish-yellow, anterior femora very bright, patellæ and tibiæ i and ii all black, as well as tip of metatarsi i and ii, tibiæ and metatarsi iv black on tips; sternum black; abdomen dull black above and below. Cephalothorax slender, eye region very high and projecting over the concave clypeus. P. M. E. less than diameter apart, plainly farther from nearly equal P. S. E.; A. M. E. slightly larger than P. M. E., and about two diameters apart, much closer to the slightly smaller A. S. E. Palpi heavy. Legs rather short; abdomen oblong-elliptical, the broad tip extending much beyond spinnerets.

Length 3.5 mm.

Two females from Olympia, Washington. Readily known by contrasting colors of the legs.

Crustulina pallipes n. sp.

Cephalothorax and sternum dark red-brown, abdomen dark brown above, almost black beneath, spinnerets pale, and sometimes a pale dot each side of them; legs pale yellowish or reddish-yellow. Cephalothorax short and broad, elevated in eye region; P. M. E. about diameter apart, and as far from the barely equal P. S. E.; A. M. E. scarcely as large as P. M. E., fully diameter apart, and closer to A. S. E.; quadrangle of M. E. rather broader behind than in front, and a little broader than high; clypeus concave; mandibles slender, longer than height of clypeus; sternum barely longer than broad, and broadly rounded or almost truncate between the hind coxæ, its surface is scabrous. Legs slender, but rather short, first pair but little longer than fourth, all rather heavily clothed with hairs and bristles. Abdomen very broad, sometimes fully as broad or broader than long.

Length 2.2 mm.

Several females from Olympia, Washington (Kincaid).

Gonglydium kincaidi n. sp.

Cephalothorax yellow-brown, black around eyes, a black marginal seam, and a black median line; legs and mandibles pale yellowish, sternum darker brown; abdomen black above and below; on dorsum there is a submedian row each side of five transverse white marks, nearly touching each other and the apical pair connected. Cephalothorax rather broad, head scarcely elevated; P. M. E. one and one-half diameter apart, and as far from the equal P. S. E., A. M. E. small and close together.

Mandibles unarmed; male palpi short and small; sternum triangular, very broad, pointed behind; abdomen rather short and broad, not flattened; legs moderately slender, without spines, tarsi i fully three-fourths of metatarsi i.

Length 1.5 mm.

One male from Olympia, Washington (Kincaid).

Exechophysis nigriceps n. sp.

Cephalothorax yellow, head black, clypeus lighter, dorsum of abdomen with a reddish shield, with black hairs, venter dark gray, sternum yellow-brown, darker on edges; femora, patellæ and tibiæ brownish, other joints yellowish, spinnerets pale. Head elevated and projecting forward, short stiff hairs on anterior part of elevation; posterior row of eyes nearly straight, anterior row a little procurved, the A. M. E. much smaller and closer together than the P. M. E. Hind legs much the longest, no spines above on tibiæ, but some stiff bristles below on tibiæ and metatarsi; sternum broad, triangular, projecting between the hind coxæ on the venter near spinnerets is a curved transverse line which looks like a furrow.

Length ♂ 1.3 mm.

One ♂ from a swamp near Ithaca, N. Y., in May. A ♀ from Sea Cliff, N. Y., which is possibly this species, has the eyes similar, the head elevated and swollen in front, there is no shield on the abdomen, the whole color paler, the head, however, is black, the legs white and more slender than in the ♂.

Exechophysis palustris n. sp.

Cephalothorax yellow-brown, darker around head; abdomen blackish (a little discolored); palpi quite dark; legs bright yellow; venter dark gray; sternum yellow-brown, darker on edges; spinnerets pale. There is a hard shield covering the dorsum of abdomen; the head is much narrower and more pointed than in *E. nigriceps*; the palpi are quite different from that species, the tibial joint being greatly enlarged; otherwise it is very similar to *E. nigriceps*.

Length 1.5 mm.

Two males from Ellis Hollow Swamp, and Fall Creek, Ithaca, N. Y., in May.

Linyphia bicolor n. sp.

Cephalothorax reddish-yellow; eyes on one large black spot; legs reddish-yellow on basal part, brownish toward tips; mandibles reddish; sternum black; maxillæ black on basal outer side, the inner apex yellowish; abdomen black above and below; cephalothorax broad behind, narrow in front; posterior eye-row barely recurved, P. M. E. one and one-half diameter apart, and two and one-half diameters from the equal P. S. E.; A. M. E. projecting forward, more than diameter apart, and twice as

far from the equal A. S. E.; the S. E. on a slight eminence, and barely separate; quadrangle of M. E. higher than broad, and nearly as broad in front as behind. Mandibles strongly convex in front, not very long. Abdomen in female subglobose, in male elliptical. Legs rather short, in female with few spines, more in male, especially on tibia i.

Length, ♀, 4 mm., ♂, 3 mm.

Olympia, Washington. Distinguished by contrast of color of maxillæ, as well as by other characters.

Bathyphantes pacifica n. sp.

Cephalothorax reddish-yellow, a black marginal seam, sometimes a black median line, and the eyes on black spots; mandibles reddish, often showing an oblique blackish mark; sternum blackish; legs pale yellowish, coxæ, patellæ, and tibiæ narrowly black at tips beneath; abdomen pale above, with a median black herring-bone stripe, blackish sides, and venter, latter with a pale line each side and three large pale spots on base, one on each lung-plate, and one between them; sometimes the median stripe of dorsum is connected for a greater part of its length to the dark sides. Of the usual structure of genus; P. M. E. more than their diameter apart, and nearly as close to the equal P. S. E.; a small tooth in front on each mandible; legs not very long.

Length 2 mm.

Several specimens from Olympia, Washington.

Tmeticus armatus n. sp.

Cephalothorax reddish; mandibles similar, but paler on tips; legs reddish-yellow, paler toward tips; sternum reddish. Abdomen uniform brown above and below. Head elevated; posterior eye-row slightly procurved; P. M. E. about diameter apart, and plainly farther from equal P. S. E., the latter touching the equal A. S. E.; A. M. E. smaller than other eyes, and very close together, more than two diameters from the A. S. E.; quadrangle of M. E. much broader behind than in front, and much longer than broad. Legs rather slender, with many fine hairs, no spines; femur i as long as cephalothorax; legs i and iv subequal; tarsi much shorter than metatarsi; tibia i longer than metatarsus i. Mandibles of male each with a large, curved, pointed process on upper part in front, and below on inner side one rather slender tooth, and several minute ones in vicinity. Sternum triangular, produced behind between hind coxæ in a fine point. Abdomen elliptical.

Length, ♂, .5 mm.

One male from Manitoba, Canada. The trochanters of legs are very prominent; seen from above they are as long as broad.

Phidippus texanus n. sp.

Cephalothorax red-brown, black in eye-region, the reddish brown extends forward on sides up to A. M. E.; clypeus with a fringe of white hairs above mandibles; white hair over and between A. M. E., a tuft of

bristles in front of dorsal eyes, and a smaller tuft lower down behind A. S. E.; many long erect black hairs on cephalothorax; mandibles iridescent green in front, base clothed with golden scales; legs reddish brown to very dark, the tip of joints darker, and tibia i with black apical half; all, but more especially the front pair, clothed with long white hair below and on sides, and erect black hair above; sternum dark; venter pale, unmarked except a fine dusky median line on basal half; dorsum brown, pale on sides, with two oblique white bars, white at base, extending back each side, and two approximate dark stripes on apical half, rather farther forward separated by a narrow, but very distinct, white stripe, connected to a larger spot in front. In each dark stripe are two white dots, sometimes connected to the median white line. This mark resembles that figured for *P. albomaculatus* by Peckham.

Length 12 mm.

A few females from Brazos Co., Texas, Sept. Also sent me by Mr. Scheffer from Kansas.

Pellenes formosus n. sp.

Cephalothorax pale yellowish; eye-region black, clothed with short white hair, especially prominent as a crest over the first eye-row; a large triangular black spot in the middle behind, and a brown stripe on each side; clypeus with snow-white hair, mandibles white, with a large, black, basal spot; palpi pale, the tarsi black, but with some white hairs; legs pale; femur i black toward tip, especially on outer side, patella black on outer side, tibia with a brown streak each side; femur ii blackish on inner side, brown streaks on patella and tibia; femur iii with an oblique black mark on anterior basal part, patella with three black dashes in front, one basal, two apical, tip broad; tibia iii with two dark streaks in front; femur iv with a black apical mark, and a band at base and at apex of the tibia; all legs with much long white hair, a ridge under femur i of especially long hair, and more on outer side of tibia i; the three spines on inner side of tibia i are large and flattened, a similar spine on inner side of patella i. Sternum pale; venter pale, with three dark stripes; dorsum pale, a basal black band, and two brown stripes above, joined behind, and leaving a rather reddish area between them.

Length 5 mm.

One male from Yuma, Arizona, August.

Hycia robusta n. sp.

Cephalothorax yellowish, eye-region blackish, thoracic part with some irregular streaks of blackish; some white hair around eyes, and dense long white hair in front on clypeus; a tuft of curved black bristles behind each lateral eye; legs pale yellowish, first pair rather reddish; mandibles reddish; palpi pale yellowish, with a black line each side, and clothed with long white hair; sternum pale yellowish; abdomen yellowish, with a dark indistinct stripe each side above, made up of brown streaks and

points; venter wholly pale. Structure similar to *H. pikei*, but more robust; cephalothorax rather broader; leg i heavy, 4-4 spines under tibia i, and one above base of first of inner series, one spine on inner side of patella i, and three in a transverse row near tip of femur i; hind metatarsi spined only at tip, and tibia iv with but one sub-basal and an apical pair below. Abdomen about four times as long as broad, truncate at base, with crest of hairs, sides sub-parallel.

Length 8.5 mm.

One female from Arizona (Townsend).

Plexippus vittatus, n. sp.

Cephalothorax pale yellowish brown, eye-region blackish, rather paler in middle, a row of about ten curved black bristles below side of eye region, much short white hair around eyes; clypeus pale yellowish brown, as also mandibles, palpi, and legs, on the under side of femur i near tip are two short transverse black bars; sternum and venter pale; dorsum of abdomen with a straight jet-black stripe each side from base to tip, and between them a broad stripe of white. The structure is similar to *P. paykulli* in many respects; leg i is plainly thicker than others, and rather long, there are 4-4 spines under tibia i and one above base of first of inner series, one on inner side of patella i, and five or six above toward tip of femur; tibiae and metatarsi iii and iv have long spines near base and middle as well as at tip. Abdomen about three times as long as broad.

Length 9 mm.

Female from Arizona (Townsend).

EXPLANATION OF PLATE II.

- Fig. 1.—*Gonglydium kincaidi*, male palpus.
 2.—*Bathyphantes pacifica*, male palpus.
 3.—*Bathyphantes pacifica*, male palpus.
 4.—*Exechophysis palustris*, male palpus.
 5.—*Hycia robusta*, vulva.
 6.—*Plexippus vittatus*, vulva.
 7.—*Gonglydium kincaidi*, male palpus.
 8.—*Exechophysis palustris*, head of male.
 9.—*Exechophysis palustris*, male palpus.
 10.—*Exechophysis nigriceps*, side view of male.
 11.—*Exechophysis nigriceps*, male palpus.
 12.—*Tmeticus armatus*, male palpus and mandible.
 13.—*Pellenes formosus*, patella iii of male.
 14.—*Pellenes formosus*, male palpus.
 15.—*Crustulina pallipes*, vulva.
 16.—*Bathyphantes pacifica*, vulva.
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PLATE II.
NEW AMERICAN SPIDERS.

—Mr. Schwarz exhibited a box of *Theodosia* (*Helionica*) beetles from Mount Kina-Balu, North Borneo, and spoke on the genus and on the characters used for the distinction of species. The genus is one of the few Cetoniid genera that are armed in the male with one cephalic and one thoracic horn, thus resembling the well known genus *Dynastes* of another subfamily of the Scarabæidæ, viz, the Dynastinæ. With the exception of a single species the genus is peculiar to Borneo, and up to quite a recent date specimens were extremely rare in collections. Last year Messrs. Goss and Dodge donated to the National Museum a fine collection of Mount Kina-Balu insects, among which were no less than 359 male specimens of these *Theodosia* beetles. Mr. Schwarz finds that the most elementary and most readily observable character, viz, the sculpture of the upper side, is absolutely safe to separate one of the species, *T. westwoodii*, from the rest. There were 266 specimens of this species, which is always recognizable from the double punctuation of the thorax (smaller and larger punctures intermixed) and from the peculiar punctuation of the elytra (the punctures being imperfect and umbilicate, *i. e.*, there is a semicircle open behind), and with a small puncture in the center. The horns of this species show an enormous extent of variation as to length and curvature, but the cephalic horn is always simple, *i. e.*, not bifurcate. The second series of species is always characterized by uniformly dense granulation of the thorax and by the elytra not having any punctures at the surface. The substance of the elytra is transparent and the peculiar sculpture can easily be seen within the elytra, although the punctures do not reach the surface. Several species have been made of this set, and it is worth while to record the differences. *T. magnifica* Rothschild, represented by 69 specimens, has the cephalic horn simple; *T. telifera* Bates has, on the other hand, the cephalic horn bifid, but there is not the slightest other difference between the two forms, so that when, as frequently happens, the cephalic horns get broken off, the two forms cannot be distinguished. To make the matter more interesting, each of these two forms has a companion form distinguished at the first glance by a dense

fringe of yellow hair along the inner margin of the front tibia. Thus, *Theodosia perakensis* Moser has the cephalic horn simple, but the anterior tibia fimbriate, and *T. rothschildi* Janson has the cephalic horn bifid and the anterior tibia fimbriate. There are, again, no other differences to distinguish these forms, and it may be seriously questioned whether these four forms may be considered as distinct species. It may be added that dissections of all forms of Mount Kina-Balu *Theodosias* proved that the male parts are absolutely identical. Mr. Schwarz showed also the females, some 53 in number. Among these only one, or at most two, forms can be distinguished.

Dr. Dyar stated that the Lepidoptera from Mount Kina-Balu in the Goss and Dodge collection make a very fine showing. He experienced great difficulty in getting names for all the species, however, since Whitehead's work on the results of the explorations in Mount Kina-Balu lists only the new or rare species that were taken and is, therefore, of no assistance in determining the others.

Mr. Schwarz said that it is a common fault with writers of works on exploration that complete lists of the species collected are not given, only those species either new or rare being listed.

—Mr. Norton, upon the invitation of Dr. Howard, told of certain experimental work on dimorphism that is to be undertaken by Dr. C. B. Davenport under the auspices of the Carnegie Institution, at the Biological Station at Cold Spring Harbor, Long Island, N. Y. He stated that Prof. W. E. Castle has established, in the guinea pig, an experimental form of dimorphism which follows Mendel's Law, while he himself has found the same law to hold as regards certain plants upon which he has been experimenting. What is now to be investigated is, whether dimorphism in plants and animals, as occurring in nature, follows this law. An interesting object of experimentation is the common yellow swallow-tail butterfly (*Papilio turnus*), in which, in localities where the species is double-brooded, there are two forms in the female, one black and the other yellow. Extensive breeding experiments are to be undertaken to determine, if possible, whether the

production of these two forms follows Mendel's Law and also to ascertain which form constitutes the dominant type in the species. As all the males are ostensibly yellow, the problem is a difficult one, since, if this law holds with this species, some of the yellow males must be potentially black and produce offspring in which the black type prevails.

Mr. Cook said he did not believe that dimorphism in nature follows the working of any law. The matter was further discussed by the members present.

MARCH 2, 1905.

The 194th regular meeting was held at the residence of Messrs. A. L. Quaintance and W. M. Scott, 1809 24th St., N.W., President Banks in the chair and Messrs. Ashmead, Burke, Gill, Girault, Hinds, Hopkins, Howard, Pratt, Quaintance, Scott, and Webb, members, and Messrs. Davis, Johnson, Strauss, and McClendon, visitors, present. In the absence of the secretary Mr. Pratt was appointed secretary *pro tem*. Prof. Thomas B. Symons, Entomologist of the Maryland Agric. College Exp. Station was elected an active member. The acting secretary read a letter from Prof. J. B. Smith relative to a National Association of Entomologists; this was discussed by Messrs. Ashmead, Banks, Gill, Hopkins and Quaintance. The matter was referred to the following committee appointed by the President at the request of the Society, Messrs. Ashmead, Titus and Quaintance.

Mr. Webb exhibited specimens of two species of *Desmocerus* and presented the following paper:

DESCRIPTION OF A NEW SPECIES OF *DESMOCERUS* WITH
A SYNOPTIC TABLE OF THE GENUS.

BY J. L. WEBB.

Desmocerus piperi n. sp.

♀.—Length 20.5 mm. Head, prothorax, ventral surface, legs, and antennæ bluish black; elytra bluish green, with narrow orange margins. Body elongate; head scarcely as long as prothorax, narrowed towards base; prothorax narrower than elytra, and strongly narrowed towards head, with an

obtuse elevation midway on each side, basal angles produced into spines; elytra scarcely narrowed posteriorly, posterior margin rounded with apices sub-acute.

♂.—Length 18.8 mm. Elytra distinctly narrowed posteriorly, and uniformly dull orange colored in pinned specimens (bright orange-red when living).

♀ and ♂ type No. 8401, U. S. N. M.; ♂ Blue Mts., Wash., July, 1896. Collector, C. V. Piper. The specimens before me, 15 in number, show little variation from the type, except one male, in which the fifth joint of each antenna is deformed.

Collected in numbers by Professor C. V. Piper, in the Blue Mountains of Oregon, and the Bitter Root Mountains of Idaho, feeding on the flowers of the black-berried elder, *Sambucus melanocarpa*.

The following table will aid in the identification of the species of this genus:

I. Elytra with basal third orange-colored, posterior two-thirds blue, without orange margins. Sexes equal in size and of the same color. Elytra of ♂ not distinctly narrowed towards apex.....*palliatu*s.

II. Elytra with orange margins in one or both sexes; males smaller, with elytra distinctly narrowed towards apex.

A. Elytra with narrow orange margins in both sexes.

a. Elytra pubescent.....*cribripennis*.

b. Elytra glabrous, punctures dense and fine towards apex.....*californicus*.

B. Elytra with orange margins in female; entire elytra orange in male.

a. Female elytra with narrow orange margins...*piperi*.

b. Female elytra with broad orange margins, darker only on median dorsal surface.....*auripennis*.

—Mr. Pratt exhibited slides and figures of larvæ, pupæ and adults of *Ceratopogon guttipennis* Coq. which he had found in the mountains at Bluemont and Woodstock, Virginia. The larvæ were found living in hollow tree stumps filled with water, in company with larvæ of three species of mosquitoes; *Culex triseriatus*, *C. signifer*, and *Anopheles barberi*. Their food seemed to be the rotting leaves, dead insects and other débris. He stated that the little "gnats," or, as they are locally called "punkies" or "no-see-ums," were exceedingly troublesome, especially early in the morning. Mr. Burke asked if any species of *Ceratopogon* occurred on the Pacific coast and M

Pratt replied that he had seen specimens from California and there was no reason why other species should not exist on the coast further north. Dr. Hopkins stated that he had had some experience in West Virginia and Maine with these insects and they were exceedingly troublesome.

—Dr. Hopkins exhibited specimens of fossil mesquite wood from Texas Hill, Arizona, showing distinct fossilized borings, apparently of a Cerambycid larva; and some fragments of petrified wood from the same locality showing insect borings filled with perfectly preserved egg-like objects.

—Dr. Hopkins made a few remarks on the Scolytid larvæ and their mouth-parts. He stated that he had found very constant characters in the larva which greatly simplified the classification of several groups. A box of pinned larvæ was exhibited, and several plates of drawings were also shown. Dr. Gill asked if the larval hooks mentioned by Dr. Hopkins were co-ordinate with any character in the adult. Dr. Hopkins replied that so far as he could determine they were not.

—Mr. Banks presented the following paper:

NEW TRICHOPTERA FROM JAPAN.

BY NATHAN BANKS.

Some time ago Mr. S. I. Kuwana sent me a small collection of caddice-flies from Japan. I was at work on them when Mr. Nawa reached Washington bringing some more species. The following paper is based on these two collections. They contain 25 species, 9 of which have been described, 12 of which I describe herewith, and four are represented by females not sufficiently characteristic to be described. Two of the described species have only just been published by Dr. Ulmer, and I had them in manuscript. Three new genera are described, all in the Limnephilidæ. None of the species are European, but one was described from Eastern Siberia. Doubtless collections from the northern parts of Japan will show some European species.

Too few species are as yet known to make any generalizations regarding the trichopterous fauna of Japan. There are several remarkable genera present, most noteworthy is *Perisoneura* which has a series of costal cross veins. It may be also mentioned that the largest caddice-fly known is from Japan, *Holostomis regina*, a magnificent insect.

Phryganea latipennis n. sp.

Face pale brown, vertex with long yellowish hair in middle, brown on sides; antennæ pale, basal joint brown; palpi brown; thorax pale, with yellowish hair in a broad stripe through the middle, and brown on the sides; abdomen brown; legs pale yellowish, anterior and middle tibiæ brown, especially on outside; wings gray, with much black hair along basal part of costa; pterostigma black, containing a few white dots, and behind it in the base of the first apical cell is an elongate dark spot, also a smaller one near base of the third apical cell; the middle area of wing before the discal cell is very pale; the outer margin blackish, extending up on the veins; anal region pale; venation mostly pale; hind wings gray-hyaline, dark on costal area, blackish at the pterostigma, and clouded at tip. Both wings very hairy. Discal cell of fore-wings much shorter than pedicel, shorter than in *Ph. sordida*.

Expanse 30 mm.

One specimen from Gifu, Japan.

Nemotaulius n. gen.

In most respects similar to *Grammotaulius*, but in the hind wings the first apical sector is connected to the radius or runs into it near tip.

Type: *Gr. brevilinea* McLachlan.

In the specimen before me, which I consider the same as McLachlan's, the apical sector runs into the radius just before tip.

Nothopsyche n. gen.

Near to *Chilostigma*; differs therefrom in the longer palpi, the second joint of the maxillary palpi being longer than the third, in the slender labial palpi, and in the less strongly marked pterostigma. Spurs 1-2-2; discal cell very long, fifth apical cell acute at base in both pairs, and barely reaching the anastomosis, fourth in hind wings broad at base.

Type: *N. pallipes* Bks.

Chilostigma ruficollis Ulmer, recently described in the *Stettiner Zeitung* from Japan, also belongs to this genus. I have a specimen of it from Gifu.

Nothopsyche pallipes n. sp.

Face pale yellow, vertex blackish, with a median reddish line, and paler behind, with black bristles; palpi pale; antennæ pale, basal joint blackish, especially above; prothorax pale, with some black bristles above; rest of thorax rather reddish; abdomen pale on base, brown toward tip above, venter pale; legs pale yellowish, the tarsal joints darker at extreme tips, spines black, none above on tibia i. Fore-wings yellowish hyaline, minutely tuberculated, with appressed yellowish and scattered erect black hairs; the extreme outer margin faintly dusky, a hyaline mark at arculus; hind wings gray hyaline, barely darker towards tip. The

maxillary palpi are very long, the second joint plainly longer and thicker than the third; labial palpi short, slender (not as long as in *N. ruficolle*). Wings rather broad, broader than in *N. ruficolle*, venation similar to that species, but the discal cell is a little longer, and the radial sector a trifle more bent at the pterostigma.

Expanse 34 mm.

One specimen from Gifu, Japan.

Moropsyche n. gen.

A Limnephilid; maxillary palpi of male slender, second and third joints subequal; vertex elevated transversely in the middle, the black ocelli at sides of this elevation; basal joint of antennæ not very long; prothorax short; spurs 1-3-4; fore-wings rather narrow, subcosta running into costa, discal cell short, vein closing it weak, forks 1, 2, 3, and 5 present, fork 1 not reaching the discal cell, the pedicel about one-half the length of fork, fork 3 almost reaching the anastomosis, median sector arising just a little before the anastomosis, so that the arculus is as far out as anastomosis; in hind wings the discal cell is open, fork 1 very short, with long pedicel, forks 2 and 3 acute at base, latter not reaching the cross-vein.

Type: *M. parvula* Bks.

Moropsyche parvula n. sp.

Black, some yellow hairs on face, and near base of antennæ; legs pale, especially the tibiæ and tarsi, these with black spurs and black spines. Wings blackish, or fumose, sparsely black haired, and with much appressed yellow hair; antennæ distinctly crenulate within. Wings narrow, rather rounded at tips, venation rather fine.

Expanse 12 mm.

Two males from Hikosan, Buzen, Japan, 28 March.

Brachycentrus vernalis n. sp.

Head black, clothed with black hair; maxillary palpi with very long black hair, labial palpi with short hair; antennæ rather heavy, dark brown, first joint black, not elongate; thorax black, with black tufts on anterior lobes; abdomen black, with a few black hairs; legs black on coxæ and femora, paler beyond, especially on hind pair, which are clothed with short, whitish hairs; wings dull black, darker along costa and hind margin. Venation as usual in genus.

Expanse 22 mm.

Two specimens from Hikosan, Buzen, Japan, 28 March.

Gæra japonica n. sp.

Similar in size and general structure to *G. pilosa*, but paler yellow throughout; the swollen area in the front wings at end of the "area interclavialis" is not near as large as in *G. pilosa*; the fork of front wings

extends fully to middle of discal cell (on outer third in *G. pilosa*); fork 3 has a shorter pedicel than in that species. The comb on venter of male has five teeth each side, and the middle one is not much longer than the others; the male genitalia also differ.

Expanse 18 mm.

Two males from Kawana, Japan, 25 June.

Crunæcia albicornis n. sp.

Head black, with tufts of long black hair above eyes; antennæ black, on basal joint with long erect black hair all around, beyond this joint the antennæ are nearly white, the first few joints marked with black; palpi pale brown; thorax black, with some tufts of black hair in front; abdomen dark brown; legs pale brown, almost white on tarsi; wings blackish, with long black hairs, and short, yellowish appressed hairs, fringe blackish, with two or three white patches on outer part, hind wings blackish, with some short yellowish hair, fringe long, some white spaces in it between ends of veins. Structure, in general, similar to the other species; spurs 2-4-4; basal joint of antennæ very long and slender and densely clothed with long hair, no cilia on thread of antennæ; maxillary palpi small and slender, pendant. Wings with forks 1, 2, 3, 5; discal cell longer than the pedicel, but fork 1 extends only a little way on it, fork 3 reaches anastomosis, but not farther, the cross-vein connecting cubital and anal is before middle of discal cell; in both wings the cross-vein at base of the fourth apical cell is hyaline white.

Expanse 20 mm.

Two specimens from Hikosan, Buzen, Japan, 28 April.

Perissoneura similis n. sp.

Jet black; front and middle legs nearly white, hind pair darker; male with a large white spot in each wing beyond the anastomosis, elongate and bent outwards, the inner side distinct, but outer edge ragged and fading out, the one in fore wing has the inner side angulate, the one in hind wings has the upper part of inner side concave; female with wings entirely black, except faint small whitish spot in base of second and fourth apical cells, and on the thyridium, in the hind wing a small spot in base of fourth apical cell. Wings shaped about as figured for *P. paradoxa* McLach. or a trifle more elongate; the costal cross-veinlets are present, but the discal cell is longer, the apical cells rather shorter, the anastomosis more regular, and fork 4 is absent in both sexes.

Expanse, ♂, 46 mm., ♀, 50 mm.

Two males and one female, from Hikosan, Buzen, 29 May, and Tsuno, Buzen, Japan, 8 May.

Perissoneura japonica n. sp.

Similar in most respects to *P. similis*, it differs in shorter and more rounded wings, the white spots of male are broader, not so elongate,

placed a little nearer the tip, and with the outer margin as sharp and distinct as the inner edge, the inner side of the mark in both wings is slightly concave; the general color of the wing is more of a deep brown than a black, and is rather shining. The species is also smaller than *P. similis*. The genitalia show differences as figured.

Expanse, ♂, 38 mm., ♀, 44 mm.

One pair from Gifu, Japan.

This is probably the species figured by Dr. Ulmer as the male of *P. paradoxa*, which was described from a female. However, McLachlan says that fork 4 is present in forewings and so figures it, while in this and *P. similis* fork 4 is absent in both sexes. Dr. Ulmer says nothing about this matter. Moreover the anastomosis of *P. paradoxa*, as figured, is very much more irregular than in either of my species. Therefore, I believe that *P. paradoxa* is unknown to Dr. Ulmer and myself, and that there are at least three species of *Perissoneura* in Japan, if indeed my two species do not form another genus on account of the absence of fork 4.

Odontocerum japonicum n. sp.

Black; wings brown, anterior pair rather darker than hind pair, and darkest in the apical third; legs brown, tibiae and tarsi paler. Differs at once from the European *O. albicorne* in that the discal cell of fore wings is extremely long, fully five times as long as its pedicel, the first apical cell not reaching back on the discal cell more than one-fifth its length; the fifth apical cell has a pedicel rather longer than in *O. albicorne*, and the third apical cell is also acute at base, and short pedicellate. The antennae are barely dentate.

Expanse 34 mm.

Two specimens from Gifu, Japan.

Molanna mæsta n. sp.

Brown; wings dusky, with some black, and more yellowish appressed hair, blackish on apical margin, and extending somewhat up on the veins; hind wings paler, the costal area rather yellowish, fringe of anal region very long, gray, especially long on the basal lobe; legs yellowish, with yellowish spurs, and some fine black spines on underside of the tibiae and tarsi. In fore wings the median vein beyond the anastomosis has three branches; the first apical cell is swollen above near tip. Venation of hind wing of male as figured.

Expanse 27 mm.

One male from Gifu, Japan.

A black-winged female *Molanna*, also from Gifu, probably represents another species, as it is smaller.

Arctopsyche japonica n. sp.

Head black, a tuft of black hair between bases of antennæ, elsewhere mostly with yellowish hair, basal joint of antennæ brownish, beyond yellowish, and beyond basal third more brownish again; prothorax densely clothed with yellow hair, rest of thorax with but few hairs, except anterior lateral tufts; abdomen black; legs yellow, spurs and tarsi more brownish. Wings clear yellowish, outer and posterior margin black; a black streak from pterostigma extends along radius and subcosta toward, but not reaching, base, and an oblique band across wing from pterostigma, forked behind; just before posterior apical angle there is a large yellow spot; hind wings yellow, with outer margin black from the pterostigma to tip and along apical margin, and the posterior margin narrowly black, an oblique black band, not very heavy, from pterostigma across wing to near the middle. Venation very similar to *A. ladogensis*; an oblique costal cross-vein, a cross-vein from the short discal cell to the radius, all five apical forks present, no ocelli, spurs 2-4-4, no filament on sides of male abdomen, antennæ subserrate within, joints 2, 3, 4, of maxillary palpi subequal in length, 5 long and slender.

Expanse 22 mm.

Hikosan, Buzen, Japan, 28 April; also from Gifu.

Philopotamus japonicus n. sp.

Head black, with a few hairs; palpi brown; antennæ dull black; prothorax with some golden hair, rest of thorax and the abdomen dark brown or blackish; legs pale brown; wings brown, clothed with short, appressed black hair, and with about thirty or forty spots of golden yellow hair. Venation dark brown, hind wings fumose, forks 3 and 4 pedicellate, fork 3 with longer pedicel; otherwise venation as usual. The male appendages are two-jointed, but lack the extra appendage from the basal joint that is figured for the European species.

Expanse 16 mm.

Three specimens from Hikosan, Buzen, Japan, 28 March.

The other species in the collection from Japan are as follows:

Holostomis regina McLachlan—Gifu.

Phryganea japonica McLachlan—Gifu.

Phryganea sordida McLachlan—Gifu.

Glyptotælius admorsus McLachlan—Gifu.

Nemotaulius brevilinea McLachlan—Gifu.

Limnephilus sp. ♀—Gifu.

Nothopsyche ruficollis Ulmer—Gifu.

Rhabdoceras japonica Ulmer—Gifu.

Rhyacophila sp. ♀—Gifu.

Glossosoma sp. ♀—Gifu.

Macronema radiatum McLachlan—Gifu.

Hydropsyche sp. ♀—Gifu.

Stenopsyche griseipennis McLachlan—Akamura, Kawana, and Gifu.

Besides these there are described from Japan the following:

Phryganea melaleuca McLachlan, *Perissoneura paradoxa*, McLachlan, and two species of *Rhyacophila*, by Morton.

EXPLANATION OF PLATE III.

- Fig. 1.—*Nothopsyche pallipes*, genitalia, ♂.
 2.—*Arctopsyche japonica*, fore wing.
 3.—*Moropsyche parvula*, genitalia, ♂.
 4.—*Perissoneura similis*, ♀.
 5.—*Molanna mæsta*, hind wing of male.
 6.—*Molanna mæsta*, male genitalia.
 7.—*Philopotamus japonicus*, genitalia, ♂.
 8.—*Moropsyche parvula*, hind wing.
 9.—*Gera japonica*, genitalia, male.
 10.—*Nothopsyche pallipes*, maxillary palpi, male.
 11.—*Crunæcia albicornis*, head of male.
 12.—*Perissoneura japonica*, genitalia.
 13.—*Brachycentrus vernalis*, genitalia, top view.
 14.—*Brachycentrus vernalis*, genitalia, side.

Mr. Ashmead asked to what fauna the Japanese species were allied. Mr. Banks replied that there was too little known to venture any opinion. He stated that one species spreads over the Malayan region and another, a *Macroneuron* from E. Siberia, is not represented in Europe, but does occur in the tropical regions. Dr. Gill asked if the adult had ever been bred from the valvate case described by Isaac Lea as a shell. Mr. Banks stated that as far as he knew it had not been.

—Dr. Howard called attention to a recent report received by him relative to “blind mosquitoes” in Florida. He asked Messrs. Ashmead and Quaintance if they could throw any light on the subject. Mr. Ashmead stated that the insects were males having plumose antennæ and so far as he knew had not been identified. He had observed their assembling in houses.

Dr. Howard stated that the site of the house where the present meeting was being held was one of his collecting places years ago.

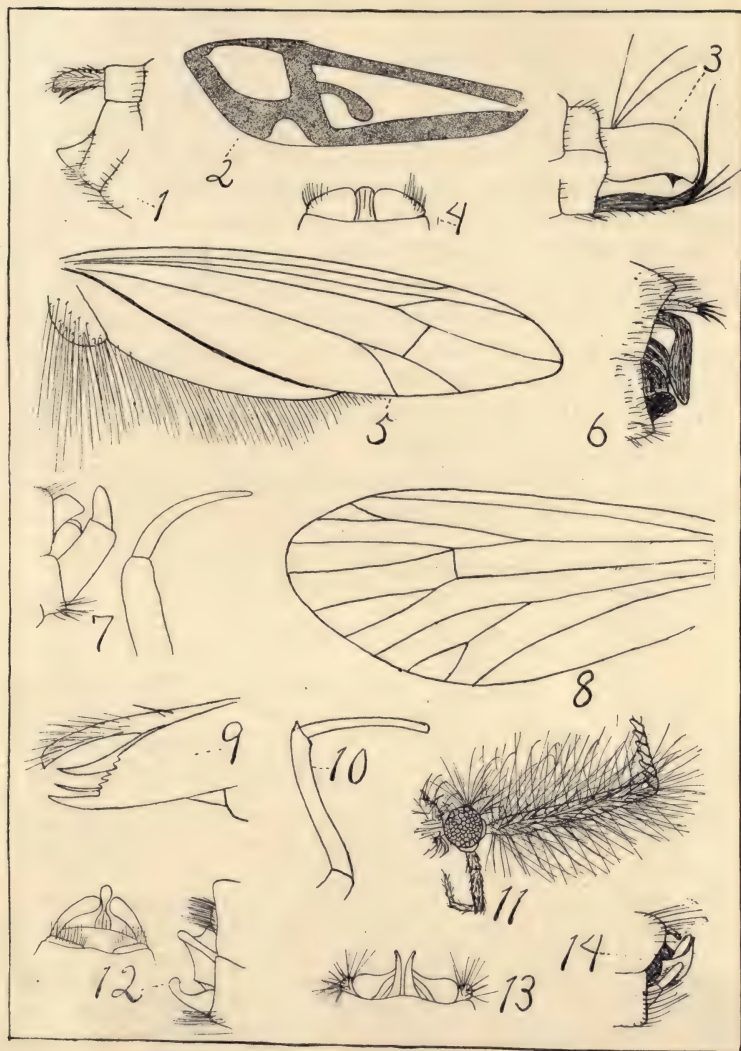


PLATE III.
NEW TRICHOPTERA FROM JAPAN.

APRIL 6, 1905.

The 195th regular meeting was held in Sangerbund Hall with the Vice-President Dr. Hopkins in the chair. Members present: Messrs. Barber, Benton, Chittenden, Couden, Currie, Gill, Heidemann, Knab, Morris, Patten, Piper, Pratt, Quaintance, Sasscer, Schwarz, Titus, Ulke, Webb, Webster. Visitors: Messrs. Clemons, Pincus, Strauss, and Ulke.

Motion made and carried that a committee of two of the younger members be appointed by the chair to make an inventory of the number of copies of each number of our proceedings now on hand and available for sale. Committee appointed, Messrs. Barber and Titus.

Mr. Chas. S. Davis, No. 9, The Lexington, Washington, D. C., was elected an active member.

Mr. F. M. Webster exhibited specimens of *Isosoma* spp. and presented the following paper:

A NEW ENEMY OF TIMOTHY.

BY F. M. WEBSTER.

In 1898 there was sent to the Department of Agriculture from Jamestown, Pa., a number of stems of timothy containing larvæ. Nothing but *Eurytoma*, however, emerged from them, and as this is a genus of parasites, nothing could be determined relative to the true depredator.

In July, 1904, a considerable number of timothy stems were sent to the Department from Marcellus, N. Y., some of which contained larvæ unmistakably of *Isosoma*.

In August and September following the receipt of this New York material, I found apparently the same insect infesting timothy at Dublin, and Falls Church, Va., in Maryland, about Washington, in Ohio, Michigan, Indiana, Illinois and North Dakota. Later, one of my assistants, Mr. Phillips, found seemingly the same thing in timothy at Knoxville, Tenn., Rives, Ky., and Cranesville, W. Va., while another assistant, Mr. Reeves, found similar larvæ in timothy in Iowa and Nebraska, so that by December last we had material from 22 localities, in 13 States. With two or three exceptions we have reared adults from all of these collections, besides, in several instances, rearing them also from hay taken from barns during the past autumn and winter.

As yet no special effort has been made to determine the species and there may be more than one involved. With what data we now have, this infestation appears rather more marked in the east than to the westward, although it was reared fully as abundantly from Sault Ste. Marie, Mich., as from New York, but this may be due to a seemingly utter lack of parasites in the former locality.

While it is yet too early to attempt to forecast its economic significance, it may be stated that I have been able to rear adults in greatest abundance from material secured where timothy hay is a main farm crop. Also, there has been no difficulty in rearing it from hay taken from meadows of several years standing and where last year's crop was short and the heads of the grass very small. So, too, where we get adults in greatest abundance a short crop of hay and seed was reported. I have so far been unable to locate those larvæ in timothy about my own farms in northern Illinois, where we allow a meadow to stand but one year and then pasture it, and roadsides are kept mown off during the summer. These larvæ work in the joint, precisely as does the summer form of *Isosoma grande* and they do not distort the stem after the manner of *I. tritici* in wheat.

While all of this would indicate a foreshortening of the stem, and therefore a serious injury to the timothy hay crop, as well as a shrinking of the seed, also a valuable crop, we still lack the careful and exact studies in the field, necessary to prove this, and these we hope to supply during the coming summer¹. It should be stated, however, that larvæ have frequently been found in timothy stems of rank growth and seemingly full development. Whether we shall finally encounter the same species in other grasses, or not, I cannot now say, but at least closely allied forms are obtainable from other grasses, both wild and cultivated.

Now, as to parasites. While, in our rearings from timothy, we get a limited number of the old and well known parasites of other species of *Isosoma*, viz, *Eupelmus allynii*, *Stictonotus isosomatis* and *Semiotellus chalcidephagus*, these have occurred comparatively rarely, though it must be stated that none of them have been found in great numbers, even in cases where *Isosoma* were excessively abundant in grain fields, as is usually the case. An undescribed species belonging to the genus *Cryptopristus* reared in immense numbers from wheat seriously affected by *Isosoma tritici* from Dublin, Va., to Clare, Mich.,

¹ Since the presentation of this paper it has been shown that shrinkages in the seed may amount to from 5 to 18 per cent.—F. M. W.

has not once been encountered in connection with our rearings of *Isosoma* from timothy, even where the wheat and timothy were growing in the same locality. The principal parasite and one that is clearly holding the timothy *Isosoma* in check in some localities, is *Syntomaspis lazuella*, and where this occurs in greatest abundance we almost invariably get few or no *Isosoma* from timothy, while if few parasites occur the reverse is the rule. This *Syntomaspis* also deserves more than a passing notice. Its occurrence is peculiar. It may be reared in abundance from *Isosoma* infested rye, but not from similarly infested wheat, even where the two grains are grown on the same farm. I have never got a single individual from either wheat or *Elymus*, though both were badly infested by *Isosoma*, while it was certainly excessively abundant in the neighborhood and reared there from both timothy and rye, known to contain *Isosoma* larvæ.

There seems to be an interesting feature of this *Syntomaspis* involving both color and geographical distribution. Specimens reared from timothy and other grasses, except *Elymus*, from Virginia, Ohio, Michigan, Indiana, Northern Illinois, North Dakota and (the type) West Cliff, Colorado, are metallic green, with metallic, more or less blue, abdomens, while those from Kentucky, Tennessee, Georgia, Alabama, Mississippi, Texas, Oklahoma, and Kansas, are entirely of an indigo blue. Curiously enough, in southeastern Nebraska and southern Iowa we find both colors intermixed. These color differences are more marked in fresh specimens. It is possible, of course, but hardly probable, that these two colors indicate different species.

Mr. Ashmead stated that he also had noticed color differences in several species of *Pteromalidæ* and *Torymidæ* from blue to metallic green. The same difference also occurs in some *Chrysididæ* and in some *Carabid* beetles. Mr. Ashmead also stated that he had lately received from Ivan Vassilief, from Russia, a species of *Isosoma* which that gentleman reported was parasitic on *Cephus pygmæus* in wheat stems. This Dr. Ashmead stated was of course only an error of observation.

Dr. Gill called attention to the cases in nature where allied species are constant for one species and variable in the other. He stated that there were several notable examples among the shells. Mr. Schwarz made some remarks on the extreme

variation which occurs in some species of Coccinellidæ and stated that in this family many species have the power of varying from the spotted to the unspotted form and to the melanic form, citing as an example species of *Hippodamia* and other allied genera. Many of the forms are considered good species by some of our writers on this family. Mr. Knab remarked upon the effect of temperature on the coloration of different forms and said that in Europe experiments have been made to show that the melanic form can be produced at will by subjecting pupæ to both extremes of temperature. He mentioned the fact that the melanic form of *Adalia bipunctata* always occurs in the fall. Prof. Piper spoke of the extensive breeding experiments carried on at Leland Stanford University by Prof. Kellogg. Mr. Ulke spoke on the variability of *Hyperaspis* and *Exochomus*. Mr. Schwarz stated that he believed all species of these genera are spotted and that the uniformly black ones are all variations. Mr. Webster noted the fact that some metallic green insects remain their natural color if dropped in potassium cyanide while the same species placed in alcohol would turn blue.

—Mr. Titus exhibited larvæ and adults of a sawfly (*Taxonus nigrosoma*). One of these larvæ was found by Mr. Couden in an apple purchased in Washington. It had made a short channel in one end and had evidently chosen this as a convenient place in which to hibernate. This species has been reared by Dr. Dyar from *Rumex* and *Polygonum* and by Mr. Titus from sugar beet. The habit of pupating in apples has also been reported by Dr. Fletcher in Canada.

—Mr. Barber exhibited specimens of a curious larva, with slides and photographs, and presented the following note:

ILLUSTRATIONS OF AN UNDETERMINED COLEOPTEROUS LARVA.

BY H. S. BARBER.

On May 12, 1903, during a few hours collecting at Hesperia, Cal., under the dry bark of a dead tree-yucca (*Yucca arborescens*) the writer found a colony of queer larvæ which puzzled him greatly. They were placed in a small tin box with some

of the bark and débris which was near them and mailed to Washington. But unfortunately no observations were made regarding their natural food. The specimens were placed in a breeding-jar with part of the root of a small yucca cultivated in the grounds of the Department of Agriculture, and attempts were made to feed them, but without success. One by one they died till but one, the largest, was left. This one finally died in July, 1905, having been alive, in captivity, and without feeding, for twenty-six months, during which time probably two skins were cast, though no record was kept. The heads of the cast skins could not be found.

The larvæ are extremely slow in their movements, lying with the fringe surrounding their bodies closely appressed to the uneven surface of whatever they may be placed on, the tail extended, but if disturbed the head is slightly raised, and the tail bent forward over the back. This is the position in which most of them died.

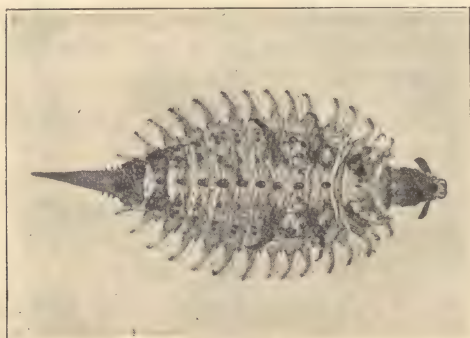


FIG. 11.—Undetermined coleopterous larva (enlarged about $5\frac{1}{2}$ diameters).

Slides were made from some of the dead specimens and the accompanying photomicrographs were taken from them.

No one has, as yet, satisfactorily placed the insect, but to all appearances it is coleopterous, as there are serious objections to its being placed in any other Order. The first opinion of several authorities has referred it to the Endomychidæ, but this has always been withdrawn on further examination and generally no opinion given in its place. In want of a more satisfactory location Mr. Schwarz suggests that it may possibly represent an unknown genus in the subfamily Phengodinae of the Lampyridæ.

The body is very flat, oval in outline, bearing a lateral fringe similar to that of an *Ascalaphus* (as figured by Westwood, Trans. Ent. Soc. Lond., 1888, pl. 1), but more uniform; a dorsal row of tubercles, and a tapering tail, one-fifth as long as the body. The color is a dirty brown above, paler beneath. Length 7 to 10 mm.; width $3\frac{1}{2}$ to $4\frac{3}{4}$ mm.

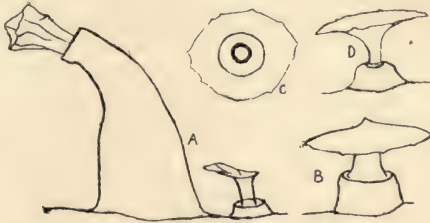


FIG. 12.—Undetermined coleopterous larva: A, lateral spine of tail with small scale-bearing tubercle such as cover tail and head, at base; B, D, side views of mushroom-like scales and tubercles, from body; C, top view of D.



FIG. 13.—Middle leg and fringe of meso- and meta-thorax and first abdominal segment of undetermined coleopterous larva (enlarged about 27 diameters).

The vestiture is so remarkable as to deserve special mention. It consists of hairs modified in a manner unknown to me in any other insect. A very few of the simplest ones are found in unexposed places and appear as simple flat scales, generally truncate, but a few are sharp pointed, set in a shallow pit,

around which the chitin is somewhat thickened. They are better developed wherever the surface of the larvæ is exposed, reaching their extreme development in the lateral fringe, and on the three lateral spines of the tail. For the commoner type—that which covers the greater part of the upper surface of the body—the thickened ring supporting the modified hair is produced into a tubercle in the hollow apex of which is set the hair which broadens out after a short stalk into a flaring funnel- or umbrella-shaped organ, not unlike some fungi.



FIG. 14.—Head and prothorax of undetermined coleopterous larva enlarged about 16 diameters.

Those on the sides of the head point slightly forward and only the forward part of the flaring lip is produced, and the reverse is true of the tail. The three lateral spines of the tail (Fig. 12, A) and the teeth of the lateral fringe (Fig. 13) represent the most exaggerated form of this vestiture—the tubercles being lengthened to about four times their width, and supporting an irregularly fluted, triangular scale.

The head (Fig. 14) tapers anteriorly and is slightly constricted about the middle, with a single ocellus in the constriction on the side just behind the antennæ, which are apparently two-jointed; basal joint very small; second joint extremely large, flattened, concave, smooth, and without vestiture on the under side; its upper surface slightly convex and sparsely studded with coarse, scale-bearing tubercles similar to those on the body.

There is, however, a third joint situated at the apex of joint ii, which is so reduced in size as to be easily overlooked, being only about one-third the length of the scales with which the second joint is clothed.

Labrum small, trapezoidal, widest in front and supporting four regularly placed spines on the front edge. Mandibles simple, sickle-shaped, sharp-pointed, grooved on upper surface. Maxillary palpi four-jointed, second joint very large, terminal joint very small, cylindrical.¹ Maxillæ very small, almost hair-like, about one-fourth as long as palpi, very inconspicuous. Labium small, trapezoidal, bearing two-jointed palpi which project almost as far as the maxillary palpi.

There is nothing extraordinary about the legs, which each bear a single large simple claw, the latter apparently not being articulated with the tibia.

In addition to the median row of dorsal tubercles there are three main lateral rows of chitinized spots on the abdominal segments, which become confused and irregular on the thoracic segments. I am unable to see spiracles on the thoracic segments or the last two segments of the abdomen, but there is a very distinct spiracle near the outer edge of each of the first seven dorsal abdominal segments just in front of the outer chitinized spot.

The last abdominal segment is produced into a conical tail which bears on each side at base three lateral spines each surmounted by a triangular scale (Fig. 12, A). The upper surface of the tail shows a row of about nine tubercles.

Perhaps the most conspicuous characteristic is the lateral fringe which is about one-sixth of the entire width and is composed of fourteen lobes on each side, two on each thoracic segment and one on each abdominal segment except the last. Each lobe consists of a curved central stalk from either side of which arise four to twelve curved processes, the tip of each being truncate and bearing a fluted, triangular scale. These processes are homologous with the tubercles and modified hairs, described above, which cover the whole body.

It is hoped that future observations will solve the mystery connected with this interesting larva.

Mr. Knab presented the following communication:

¹In one of the specimens there is a queer deformity, the second joint giving rise to an extra third and fourth joint on the upper surface.

A NEW SPECIES OF DONACIA.

BY FREDERICK KNAB.

A study of the *Donacia* material in the collection of the Illinois State Laboratory of Natural History brought to light an interesting series of a species which could not be located by Mr. C. W. Leng's Revision of our species.¹ An attempt was made to locate this species with some of the many forms that have been described and relegated to the synonymy, but without satisfactory result. Finally a specimen was sent to Mr. Samuel Henshaw, Curator of the Museum of Comparative Zoology at Cambridge, Mass., with a request to compare it with the material in the LeConte collection. In his reply Mr. Henshaw wrote: "I consider it distinct from any in the LeConte collection which contains all the species recognized by LeConte and Leng."

The species belongs with *subtilis* in Mr. Leng's *Group C*, but is very distinct from any of the species defined in Mr. Leng's paper. Owing to its short thorax and rather broad and depressed form this species more nearly resembles the species of the *cincticornis* group, but the narrow mesosternum and the shorter legs and less swollen hind femora show its relationship to *subtilis*. The specimens were taken upon bulrushes, so that in habits, too, it differs from the species of the *cincticornis* group which frequent pond lilies.

Donacia curticolis n. sp.

Female: length 9.5 mm. Form rather broad, subdepressed. Color: body beneath metallic green, the prothorax ferruginous-yellow; head green; thorax above golden green upon disc, anterior and basal margins ferruginous-yellow; elytra ferruginous-yellow with golden lustre; antennæ dark, the basal segments with green lustre; femora ferruginous at base, the outer half metallic green; tibiæ and tarsi ferruginous, tinged with green.

Head obsoletely tuberculate between the eyes, with a deep median groove; surface confusedly punctured, clothed with pale yellowish pubescence. Eyes prominent. Frontal lobes prominent. Antennæ rather short, slightly over half the length of body; second segment very short, third slightly longer. Thorax straight-sided and without tubercles, broadening gradually to the front margin, half again as broad as long; surface shining, very finely wrinkled and confusedly punctured; anterior and basal margins broadly elevated, the front margin turned obliquely

¹Trans. Am. Ent. Soc., v, 18, pp. 157-176.

backward near the broadly rounded angles; median groove distinct, fading out before reaching the base. Elytra with the humeri broadly rounded and depressed, broadly elevated around the scutellum, truncate at tip and minutely dentate at inner angle; two oblique depressions near the suture, one before the middle, the other behind it, a very faint third depression towards the tip; the outer half slopes obliquely from behind the humeri; the punctures in rows, very coarse and close together, less coarse and deep towards the apex; interspaces more or less convex, the surface shining, finely and closely transversely wrinkled. Legs slender, the posterior femora with a stout tooth; the posterior tibiae with the apical half curved inward. Mesosternum narrower than the coxa. Pygidium slightly rounded, almost truncate. Under surface clothed with pale yellowish pubescence.

Types in the Illinois State Laboratory of Natural History and U. S. National Museum and the collection of the author.

Localities: Fourth Lake, Lake Co., Ill., 2 and 5 Aug., 1887 (on bulrushes, Garman and Hart); Normal, Ill., Sept., 1880 (one specimen); Indiana (one specimen).

The species varies in coloration. Of the 19 specimens examined five are ferruginous-yellow above and below, with only the head green and the femora touched with the same color. One specimen is entirely golden green above, the under side of the prothorax and the margins of the ventral segments ferruginous and traces of the same color on the legs. The other 13 are the type form.

The following paper by Mr. A. N. Caudell was then read:

THE SPECIES OF THE GENUS CHIMAROCEPHALA AND
DESCRIPTIONS OF TWO NEW SPECIES OF
CALIFORNIAN ORTHOPTERA.

BY A. N. CAUDELL.

The genus *Chimarocephala* was established by Scudder in 1876 for four species, *viridifasciata*, *brevipennis*, *cubensis*, and *pacifica*. In 1884 Saussure removed the first three species to his new genus *Chortophaga*, leaving only *pacifica*, which is therefore the type of *Chimarocephala*. At the same time Saussure described a new species of *Chimarocephala*, *beherensi* from California, and referred to that genus his *Tomonotus otomitus*, a Mexican species described in 1861. Saussure separated his new Californian species from Thomas' *pacifica*, also from California, on the characters of the thorax, which

he said was smooth with the median carina entire in the new species and rough and with the carina incised in *pacifica*. But, as proven by Thomas' original description and by his type, which is in the National Museum, Saussure did not correctly interpret his species, the characters attributed to *behrensi* really belonging to *pacifica*. *Behrensi* Sauss. therefore falls as a synonym of *pacifica* Thom. and the insect supposed by Saussure to be the *pacifica* of Thomas is unnamed. For this form I would propose the name *incisa* and would designate it as a variety rather than a species, the differentiating characters being variable.

One male specimen of *C. pacifica* from Monterey County, Cal., taken in August, 1904, by Mr. Coleman, agrees very well with the form *incisa* except that the vertex is much less elongate than usual and the body is somewhat thicker, giving it something of the appearance of an *Encoptolophus*. It is worthy of varietal distinction and may be called *obtusa*.

The species of *Chimarocephala* thus stand as follows:

Chimarocephala pacifica Thom.

behrensi Sauss.

Var.—*incisa* Caud.

pacifica Sauss. (not Thom).

Var.—*obtusa* Caud.

Chimarocephala otomita Sauss.

DESCRIPTIONS OF NEW CALIFORNIAN ORTHOPTERA.

Melanoplus sonomaensis n. sp.

A very small brachypterous species allied to *puer* and belonging to the *puer* series. Color brownish with dark markings. Head scarcely prominent in the female, slightly so in the male, reddish brown with piceous postocular bands; vertex feebly tumid, scarcely elevated above the pronotum, interspace between the eyes about as broad, male, or somewhat broader, female, than the basal segment of the antennæ; fastigium and frontal costa as in *puer*; eyes moderately prominent, more so in the male, longer than the infraocular portion of the genæ in both sexes. Pronotum with the lateral and median carinæ distinct, anterior margin truncate, posterior margin obtuse-angulate, almost truncate, especially in the female, the lateral piceous band scarcely continued onto the metazona in either sex. Prosternal spine stout, blunt, slightly inclined backwards; interspace between the mesosternal lobes as broad, male, or broader, female, than long; metasternal lobes of both sexes separated by a space much longer than broad, but in no ways attingent. Tegmina abbreviated, shorter than the pronotum in both sexes, scarcely twice as long as broad, apically broadly rounded and not meeting above in either sex, though not widely separated. Fore and middle femora somewhat

tumid in the male, the hind femora brownish with faint scalariform markings on the outer face, the inner face somewhat infuscated and the geniculations darkened; hind tibiae, in dried specimens, brownish or yellowish brown, the spines black-tipped, eleven to thirteen in outer series. Abdomen reddish brown with a lateral black stripe along the upper portion of the sides, in the male extending quite to the tip, in the female scarcely beyond the basal half. Tip of the male abdomen neither swollen nor recurved, subgenital plate noticeably narrower than long, apically forming a blunt tubercle; supraanal plate elongate-triangular, the sides straight, median sulcus broad, deep, extending across the basal half of the plate; furcula small, short blunt teeth overlying the submedian ridges of the supraanal plate; last dorsal segment of the abdomen, just outside of the furcula, diagonally sulcate as in the *aridus* series. Cerci of the male very slightly compressed and moderately incurved substyliiform appendages tapering considerably and quite uniformly on the basal three-fourths, the tip more gradually tapering to a moderately sharp point.

Length, male, 13 mm., female, 15 mm.; elytra, male, 2 mm., female, 2.5 mm.; hind femora, male, 8 mm., female, 8.5 mm.

Type.—No. 8386, U. S. National Museum.

One male, one female, Glenellen, Sonoma County, California. (E. S. G. Titus), collected on rocky hillside.

Scudder's table of the *puer* series, page 128 of his Revision of the Melanopli, may be modified for the reception of this species as follows:

f¹ Tegmina attingent; subgenital plate of male short and broad, its apical breadth surpassing the length of its lateral margins, not elevated apically. *flabellatus*.

f² Tegmina distant; subgenital plate of male distinctly narrower than long, elevated apically.

g¹ Pronotum of both sexes truncate posteriorly, distinctly emarginate mesially; interspace between the mesosternal lobes slightly longer than broad, male, or quadrate, female; metasternal lobes subattingent in the male; elytra widely separated. *puer*.

g² Pronotum obtuse-angulate, at least in the male, not emarginate mesially; interspace between mesosternal lobes quadrate, male, or transverse, female; metasternal lobes distinctly separated in the male; elytra not widely separated. *sonomaensis*.

Trimerotropis titusi n. sp.

A small species belonging to the *vinculata* group and falling next to Bruner's *inconspicua* but is in no way allied to it.

General color light brown with the elytra banded conspicuously. Head prominent, in the male noticeably elevated above the pronotum and

slightly broader than the anterior portion of it; vertex with the lateral borders well elevated and with a distinct and moderately prominent median carina; frontal costa narrow, scarcely more than one-half as wide as the interocular space in either sex, percurrent, sulcate at the ocellus and, like the entire face, punctate; eyes prominent, not as long as the infraocular portion of the genæ, in the female less than two-thirds as long; antennæ uniformly dark reddish brown. Pronotum moderately slender, the posterior process rectangular or acute, there being considerable variation in this respect; median carina moderately elevated on the prozona, linear on the metazona; prozona about two-thirds as long as the metazona. Elytra with a nearly solid black band at the humeral angle, a more or less broken one across the middle, and across the center of the apical half a third band which is usually broken up and lost in the black fleckings that occupy the apical fourth of the elytra; the basal portion of the elytra, before the humeral band, is darker in ground color than the rest of the ground surface; wings moderately broad, not quite twice as long as the greatest breadth; disk pale yellowish, the fuscous band represented by a cloud on the anal field and usually a slight infuscated spot near the costal margin; sometimes the band is not represented at all and there is never a costal tænia. Posterior femora ashy on the outer face with a black band across the apical third and a large infuscated spot on the upper half just before the middle; inner face black with two broad white bands, the lower sulcus white with a subapical black band and sometimes slightly infuscated on the basal half; hind tibiæ yellowish, the spines black on the apical half.

Length, male, 18 mm., female, 25 mm.; antennæ, male, 9.5 mm.; hind femora, male, 10 mm., female, 13 mm.; elytra, male, 18 mm., female, 21 mm.; width of wing at greatest point, male, 9 mm., female, 11 mm.

Type.—No. 8385, United States National Museum.

Eight males, 3 females, Spreckels, Monterey Co., California, on sugar beets, September 20, 1904 (E. S. G. Titus).

Superficially this species bears a very close resemblance to *Trimerotropis albescens* McNeill, but is very distinct from it. *Albescens* has the antennæ barred with black and white while here it is unicolorous, the pronotum of *titusi* is more slender than that of *albescens* and the color is considerably darker. Finally the hind tibiæ of *albescens* are blue while in *titusi* they are yellowish.

MAY 4, 1905.

The 196th regular meeting was held in Sængerbund Hall, and the president and vice-president being absent Dr. H. G. Dyar occupied the chair. The following persons were present:

Messrs. Benton, Caudell, Couden, Barber, Dyar, Heidemann, Hopkins, Patten, Pratt, Titus, Ulke, members, and Messrs. Clemons, Knab, Pinkus, and Ulke, Jr., visitors.

Mr. Titus was appointed to act as Recording and Corresponding Secretary during the absence of Messrs. Currie and Benton.

Mr. Barber exhibited specimens of *Sphæridium scarabæoides* and a map showing its present distribution in America and presented the following notes:

THE SPREAD OF SPHÆRIDIDIUM SCARABÆOIDES LINNÆUS.

(COLEOPTERA, HYDROPHILIDÆ.)

BY H. S. BARBER.

The Genus *Sphæridium* is included in LeConte and Horn's Classification (1883) but with the following footnote: "A specimen of the European *Sphæridium scarabæoides* has been found in Canada. The species is undoubtedly introduced, and accidental in occurrence" The name is included in Henshaw's Check list, 1885.

In 1893 Mr. G. Chagnon, of Montreal, Can., published¹ the following note: "*Sphæridium scarabæoides*, which has been introduced from Europe, is now very common here. I had the pleasure to send several specimens to Dr. Geo. H. Horn."

The next mention of its capture that I can find is by Mr. C. O. Houghton, in 1898,² where he records its occurrence at Potsdam, N. Y., in 1896, and gives an account of the habits.

Entomological News, Volume XII, 1901, has four notes on this species: R. F. Pearsall (p. 158) mentions LeConte and Horn's note, and records the capture in the Catskill Mts., N. Y., in July, 1900. C. O. Houghton (p. 209) records it from Ithaca, N. Y., in May, 1901; Mr. Luccareni (p. 256) from Split Rock Pond, Morris Co., N. J. (probably 1901?) and G. W. Caffrey (p. 296) records it from Bethlehem, Pa., May 28, '01.

Mr. Schaeffer gives a note concerning its spread,³ recording it from West Farms, N. Y., and also mentions Wisconsin and Canada.

Mr. Pratt took the species abundantly at East Providence, R. I., in August, 1903.

Mr. Dickerson reports it⁴ from Chester, Morris Co., N. J.,

¹ Ent. News, iv, p. 76.

² Ent. News, ix, p. 172.

³ Journ. N. Y. Ent. Soc., 1901, p. 94.

⁴ Ent. News, xiv, p. 97, 1903.

September, 1902, and Anglesea, N. J., July, 1902; and Mr. Bischoff adds the record for Irvington, N. J. Later¹ Mr. Boerner captured it at Philadelphia Neck, Pa.

In 1904² C. O. Houghton refers to its capture in, and disposal through New York, New Jersey and Pennsylvania, and adds Newark, Del., May 6, 1904 (?) to the list of places occupied by the invading beetles.

Mr. Frederick Knab, in 1905,³ records its capture by Mr. A. B. Wolcott, on the lake shore at Chicago, Ill., where the beetles had been washed up October 9, 1904. Mr. Knab also mentions capturing it at Mt. Tom, Mass., in the summer of 1902, and Hampden Co., Mass., in 1903. He also states that Rev. C. Crozet took it plentifully about Hartford, Conn., in 1901.

April 17, 1905, Mr. Pinkus brought a few specimens to the National Museum from Cabin John Bridge, Md., and a few days later Messrs. Schwarz, Clemons, and myself found it abundantly at the same place. Later Mr. Clemons brought it from Rock Creek Park, D. C.

Mr. Schwarz stated that usually when species of this character were introduced into Canada they would rarely spread southward. Since the species breeds in manure it will to some extent interfere with the development of dipterous larvæ.

—Mr. Pratt exhibited specimens of larvæ of *Abraxes grossulariata* L. that had been recently introduced into this country on *Euonymus*. The plants were sent to a Philadelphia nurseryman from England and these larvæ were noticed feeding on them by a United States Custom House officer at Baltimore, who sent them to the Bureau of Entomology.

—Dr. Dyar presented the following note on the food plant of *Derelomus* (*Notolomus*) *basalis* Lec.:

“Larvæ occurred to me at Miami, Florida, on the saw palmetto (*Chamærops serrulata*) and were sent to Mr. Kearfott to rear under the impression that they were Lepidoptera. However, the above beetle was bred, and it is thought well to here make a record of its food-plant. The larvæ occur in the flower stems of the plant boring under the bracts that subtend the joints of the stem.”

¹ L. c., p. 242.

² Ent. News, xv, p. 310.

³ Ent. News, xvi, p. 53.

Mr. Schwarz stated that this genus is composed of small weevils, pale yellow, with scarcely any sculpture. Three species have been reported from Florida; one occurs in Texas; two in Mexico (one of these in palmetto), two in Cuba, usually on palmetto flowers. In Cuba an undescribed species lives in the royal palm.

—Mr. Benton exhibited specimens of, and spoke a few minutes on the Caucasus bee. He stated that it resembles the Carniolian type, gray, but more leaden in its ground color. It is very gentle; the Department of Agriculture has had some for two years and so far they require no bee veil nor smoke to handle them. The specimens were obtained from Tiflis, but great difficulty is experienced in getting queens. Mr. Benton stated that he soon expected to go to Tiflis and would try to get queens started for this country by a faster route.

—Mr. Heidemann exhibited specimens of a pretty little Capsid, *Sysinas lineatus*. One specimen was captured by Mr. Banks at Sea Cliff, N. Y.; the species has been hitherto known only from a specimen described by Distant from Mexico.

—The Secretary read the following note:

NOTES ON EULECANIUM FOLSOMI KING.

BY T. D. A. COCKERELL.

This species was discovered by J. W. Folsom on pawpaw at Urbana, Ill., and was briefly published by Mr. King in the Canadian Entomologist for 1903, page 193. I was not quite sure of its distinctness from *E. lintneri*, and from the material seen I doubted the advisability of setting the thing forth as a new species. However, Mr. King, probably correctly, believed it to be distinct, and since it has now been published it will be advisable to present a fuller description.

Scale about 4 mm. long, $3\frac{1}{2}$ broad and about $1\frac{1}{2}$ high; flattened, rather light brown, with narrow transverse blackish stripes, the whole obscured by a copious white frosting; side more or less reticulately wrinkled. A larger (egg-laying) specimen was about $5\frac{1}{2}$ mm. by $3\frac{1}{2}$ mm. Skin orange-brown, with large gland-pits; margin strongly chitinized; stigmatal spines in threes, one long and two short. Antennæ like those of *E. tarsale*; also resembling those of *E. kingii*, but joint 3 longer.

Measurements in μ : Antennal joints: (1.) 24; (2.) 36; (3.) 102-105; (4.) 21; (5.) 21; (6.) 33-37. Anterior leg: femur + trochanter, 155; tibia, 112; tarsus, 76. Eggs white. The following species agree in having 6-jointed antennæ, with 6 very much shorter than 3, 2 longer than 4 or 5, and 4 and 5 equal or almost so: *nigrofasciatum*, *capreæ* (cf. Douglas), *rosæ* (on rose), *tarsale* (Mass., on *Cornus*) and *folsomi*. It will be observed that some of the characters of *folsomi* suggest affinity with *E. nigrofasciatum*.

—There being no further notes or papers Dr. Dyar spoke a few minutes on his recent trip to Florida and to the Northern United States and Canada. He stated that the season in Florida was very dry and the trip quite unproductive so far as mosquitoes were concerned. In the North very good results were obtained and larvæ of several of the early spring forms were being bred.

—Mr. Pratt stated that he was now breeding adults from *Ceratopogon* larvæ from Woodstock, Va.; these had passed the winter as larvæ.

—Some discussion followed on the absence of mosquito larvæ at Key West in the dry season, and also the effect the wholesale killing of mosquitoes would have on various algæ, bacteria, and other growths in the water.

JUNE 1, 1905.

The 197th regular meeting of the Society was held at the residence of Mr. J. D. Patten, 2209 R street, N.W., the President, Mr. Banks, in the chair and the following: Messrs. Ashmead, Benton, Banks, Gill, Hopkins, Marlatt, Patten, Simonds, Schwarz, Titus, and Uhler, members, present.

Mr. Titus, as a member of the committee to inventory the Society publications, presented the following report: Vol. I, 228 full sets; vol. II, 230; vol. III, 285; vol. IV, 292; vol. V, 314; vol. VI, 327; vol. VII, 334 copies of No. 1. The following copies of extras are also on hand: Vol. I, no. 1, 29, no. 3, 78, no. 4, 74; vol. II, no. 1, 15, no. 3, 85, no. 4, 63; vol. III, no. 3, 20, no. 3, 27, no. 4, 21, no. 5, 14; vol. IV, no. 2,

21, no. 3, 24, no. 4, 44; vol. V, no. 2, 8, no. 3, 8, no. 4, 11, (index vol. V, 69); vol. VI, no. 1, 12, no. 2, 8, no. 3, 19. There are also reported to be on hand 2,841 authors' extras of various papers. Upon motion of Mr. Marlatt the Society voted not to break sets of the publications below the 200 volumes.

—Mr. Ashmead exhibited some ants from Mr. Titus' collection from British Guiana and spoke a few minutes on the classification of the superfamily Formicoidea. He stated that while many writers had published articles on this great and complex group few had found, or at least had used, the really important and necessary characters. Among the authors who have written works of value he mentioned Mayr, Forel, and Emery. Dr. Ashmead has formed his classification on what he believes to be natural groups; of these groups he mentioned as examples the Cryptoceridæ, which are all fungus growers, the Myrmicidæ or harvesters, and the Dorylidæ or driver-ants.

—Dr. Ashmead also reported the receipt of many more Hymenoptera from the Philippine Islands through Father Stanton and Father Brown. Almost all of these were collected in the Observatory garden at Manila and represent many new species and several new genera. The number of species secured in so small an area gives some promise of what an enthusiastic and thorough collector should find in the remainder of the Islands.

—Mr. Schwarz exhibited the work of a leaf-rolling weevil (*Attelabus bipustulatus*) taken at Plummer's Island, Md. He stated that he wished to call especial attention to the excellent manner in which the rolls and leaf were preserved. This work had been done by Messrs. Pratt and Titus by putting the fresh green leaf into fine sand and slowly drying it by heat. There were five rolls on one leaf, the arrangement of the rolls giving the appearance of a flower.

In answer to queries on the subject Mr. Titus more fully explained the process of drying in sand and stated that there was much still to be learned about the preservation of colors; some colors could be preserved by this method while some

shades of green will change much more rapidly than others. Much seemed to depend on the amount and intensity of the heat applied, the slower steadier heat accomplishing the work much better than swift heat. The finest quality of white sand should be used; this can be procured of dealers in bird supplies.

Who was first responsible for the method seemed to be in doubt, as Mr. Titus had used the method previous to his coming to Washington and had no idea where he first heard of it. Mr. Pratt had stated that he had used this plan for drying for several years.

Dr. Hopkins reported having secured a parasite from the egg of this beetle which Dr. Ashmead stated belonged to the genus *Poropia* in the *Trichogrammidæ*.

—Mr. Marlatt spoke of the occurrence this year of brood XIII of the seventeen-year cicada in Wisconsin and Northern Illinois. Dr. Uhler spoke a few moments on the specimens of this cicada in his collection that had been collected in the vicinity of Baltimore, and stated that in his collection were specimens of the brood of 1785. He called especial attention to the variability of the species.

—Mr. Marlatt made a few remarks on the introduction of insects by the importers of plants. He called attention to the present rapid distribution and introduction of new and rare plants from all over the world by the Bureau of Plant Industry, and stated that this was becoming more and more noticeably a means of distribution of injurious insects. Our common injurious insects are doubtless often sent abroad, and although at present all importations by this Bureau are inspected at Washington, still some insects have already been admitted. *Pulvinaria psidii* had been found some half-dozen times and *Aspidiotus rossi* from India several times on tropical and subtropical plants from the country just named. Mr. Titus stated that three times during the present year the puparia of the Hessian fly has been found in wheat straw used in packing shipments of plants to this country from Tunis, Malta, and Algeria. With these lots of straw had also come several other wheat insects. Mr. Schwarz stated that the first commission

for investigating the subject of introduction of insects was Messrs. LeConte, Horn, and Riley at Philadelphia in 1876. Many things of interest were found in packing-straw used by the various exhibitors. Dr. Ashmead reported that a peculiar sawfly belonging apparently to the genus *Cimbex* was recently bred from an orchid received at London from Ceylon.

—Mr. Marlatt spoke a few minutes on his recent trip to Cuba, Florida, and Porto Ricó. He said that the value to one studying the insects injuring any group of plants, by a trip through the region where those plants are cultivated, can scarcely be estimated.

The following papers by members of the Society have been accepted by the Publication Committee during the summer:

DESCRIPTIONS OF SOME NEW MITES.

BY NATHAN BANKS.

In my "Treatise on the Acarina or Mites,"¹ several mites, mostly of genera previously unknown in this country, were referred to, and figures were given of them. I had not then the time for their descriptions, and these are now furnished, together with those of a few other interesting forms that have recently come to my attention. References are given to those figured in the "Treatise." One new genus and twenty new species are added to the fauna of the United States.

Neophyllobius americanus n. sp.

Pale yellowish, body about once and one-third longer than wide. Legs large and long, and arranged in a radiate manner, the creature looking like a minute Phalangid, since leg iv is about as near to tip of body as leg i is to front of body. Above with a submedian row of six stout, simple bristles, and from anterior margin to humeral region an irregular submarginal row of six bristles; two more bristles each side at tip. Legs very long and slender as is usual in the genus. When seen under high power they are minutely, transversely annulate. The tarsal joint is distinctly swollen before the middle. All legs with a few long stout bristles, one from the patellar joint is especially long and prominent; no clavate bristles on tarsi or elsewhere. Last joint of palpus reclinate, much smaller than other joints and slender, with two long bristles near base and about

¹ Proc. U. S. Nat. Mus., xxviii, No. 1382, pp. 1-114, 1904.

three shorter ones on tip. Venter with a few long bristles on sides and shorter ones on the disc; the genital opening, a transverse slit, not far behind mouth parts; anus at apex of body.

Body length .12 mm.

Three specimens on oak leaves at Orchard, Mobile Co., Alabama. Figured on page 28 of "Treatise on Acarina."

Gekobia texana n. sp.

Body over once and a half as long as broad, constricted rather beyond middle, rounded in front; beak very small, and not projecting far in front of body. Palpus rather slender, last joint acute, next to last showing a hairy elevation on the side; a long clavate hair each side at base of beak above. Dorsum with many capitate hairs, all of one height; four longer, simple hairs on posterior margin near tip; hairs on venter and legs are simple. Legs slender, in two widely separate groups; all subequal in size, the hind pair scarcely reaching behind tip of abdomen. Mandibles slender, with a triangular apophysis near tip. Tarsi ending in two claws.

Length 1.2 mm.

Several specimens from Austin, Texas, May; taken from a lizard, *Sceloporus floridanus*. I have figured this species on page 22 of my "Treatise on Acarina." It differs much from the other species of the genus in general appearance, but the essential characters, especially the nature of the mandibles, are the same.

Cheyletus ferox n. sp.

Body about twice as long as broad, tapering each way; much narrowed just behind hind coxæ, from thence the posterior sides are parallel, apex truncate. Beak rather short, acute; palpi very heavy, first joint with two simple hairs above, second joint with one above; the papilla bears a comb and two pectinate bristles; at the base of the claw there is a stout tooth. Cephalothorax with a simple bristle in each posterior corner; abdomen with an irregular submarginal row of about eight simple bristles, one on each shoulder, and three each side at tip. Legs quite long and slender; provided with simple bristles; leg i more slender but about as long as leg iv; penultimate joint of leg i is very slender, terminated by two long bristles, and two others near base; the last joint of leg i is short and slender, and furnished with two fine claws.

Length .45 mm.

Specimens from Marblehead, Mass. (M. J. J. Gregory) found feeding on *Tyroglyphus* among cabbage seed. This species is figured on p. 18 of my "Treatise" as *C. audax*, a preoccupied name.

Cheyletus pyriformis n. sp.

Body nearly twice as long as broad, broadest at shoulders, broadly rounded at tip. Cephalothorax with a pair of feathered bristles in front, and a pair of broad scales, three similar scales on each side, and a long feathered bristle near each hind angle, four scales forming a square in middle. On dorsum of abdomen are four rows each of three broad scales, and four rather more slender ones at the tip. The basal joints of the legs have each one or two scales and one or two feathered bristles; the bristles near the tips of legs are more simple. The palpus is moderately heavy; the femur is almost angularly swollen on outer side, with a long plumose bristle above on middle; the next joint is fully twice as broad as long, with a long plumose hair near outer edge; the third joint has a simple hair on inner side; the fourth ends in a large claw, with a row of hairs on inner side; the fifth, or papilla, bears two long curved claws, and a long comb below, with a simple bristle arising near base of comb. The beak has a pair of long plumose bristles above. Leg i ends in two long bristles, the longer is twice as long as the tarsus.

Length .35 mm.

Several specimens taken under the grape-vine scale, *Aspidiotus uva*, from material collected by Prof. Webster at Lafayette, Indiana, in December. Figured on page 17 of my "Treatise."

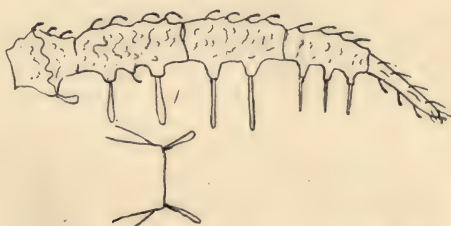


FIG. 15.—*Cæculus clavatus*: leg i, and tip of cephalothorax.

Sarcopterus longipilis n. sp.

Body subquadrate, shoulders not prominent. Dorsum with a broad shield, with sub-parallel sides, and broadly rounded behind, not reaching tip. This shield has each side in front an oblique row of three bristles, and a sub-lateral pair just before, and one just behind the middle. Dorsum outside of shield striate; two long bristles near each shoulder, one near tip each side, and a longer one in front near base of beak. Legs short and robust; i and ii with a few simple bristles, and ending in two claws; leg iii ends in four very long bristles, three of them about as long as the body; leg iv ends in five long bristles, four of them about as long as body. Mandibles with the usual row of serrate teeth above.

Length .3 mm.

Specimens taken from a tumor under the wing of a cross-bill at Washington, D. C., by Dr. A. K. Fisher. Readily separated from the European species by the much longer bristles on legs iii and iv. The adult and larvæ have been figured in my "Treatise on Mites," p. 20.

Cæculus clavatus n. sp.

Yellow-brown, legs dark brown, tarsi iii and iv black. Body with a median shield on front part, the posterior shields less distinct. The hard parts are roughened, and behind are the clavate hairs as in *C. americanus*; in front the cephalothorax has a clavate hair each side, which is longer than the clavate hair on trochaner i. Legs of the size and roughened as in *C. americanus*, all with short curved white clavate hairs, mostly in rows; on leg i, however, there are spines on inner side of femur, tibia, and metatarsus, each upon an elevation; two on femur with clavate tips, two on tibia barely pointed at tips, and three on metatarsus with acute tips; on the outer side below are three similar spines; one on the tibia, and two on the metatarsus. On leg ii on the outer side below are also three of these spines; one on tibia, and two on metatarsus

Length 1. mm.

Taken among dead leaves, near Washington, D. C. Differs from *C. americanus* in number of spines on leg i, and in that several have clavate tips.

Oribata angustipes n. sp.

Body dark red-brown, legs yellowish. Abdomen subglobose, above with a submedian row each side of eight short, curved bristles, seen under high power these are finely serrate; a pair of similar bristles on base of cephalothorax; pseudostigmatic organ simple, very long and fine, its tip wavy; two pairs of simple bristles on cephalothorax in front. Legs very slender; anterior femora nearly as long as width of body; all with a few hairs, the tibiæ with a longer bristle at tip, and a very long one on each hind femur; genital and anal apertures touching. One claw to each tarsus.

Length .6 mm.

Taken near Mt. Vernon, Virginia, among dead leaves. It is near *O. nodipes* Koch, but has longer bristles on femur iv, the tibia iv is longer, and the hairs on abdomen are thicker. I have figured it on page 69 of my "Treatise on Acarina" under the name of *O. gracilipes*, which name I now find is preoccupied.

Liponyssus americanus n. sp.

Very pale yellowish. Body rather elliptical, but truncate at tip, and slightly pointed in front. Surface minutely and obliquely striate. Dorsum with a broad elongate shield, broadest before middle near shoulders,

tapering behind to narrowly truncate tip; with about 60 to 70 stout bristles above, those near tip longer than others; a submedian and a marginal row of these on the shield. Legs quite short, with many short hairs and bristles. Anal shield elongate, broad and broadly rounded in front, tapering and pointed behind, a pair of short bristles in front and three larger ones behind. Sternal shield between coxæ ii broad, sub-quadrangular, straight behind, convex in front, a bristle near each corner.

Length .45 mm.

Several specimens taken from the arm of a person in Washington, D. C. This species is figured on page 53 of the "Treatise."

Hæmagamasus americanus n. sp.

Pale reddish, or yellowish. Body elongate oval; dorsum with many short stiff hairs. Legs moderately slender, tarsi long and slender, tarsus iv but little longer than i; all legs thickly strewn with short, stiff spine-like hairs or bristles. Leg ii (♀) very slightly thicker than other legs. Anal shield elongate oval, rounded behind, somewhat pointed in front, fully three times as long as anal opening, a pair of bristles near front, one each side of the aperture, and three in a curved row behind. Peritreme very long and but slightly curved.

Length .9 mm.

In nest of a mouse (*Peromyscus eremicus*), in the Santa Rita Mts., Arizona (Hubbard). It is figured on page 54 of the "Treatise."

Macrocheles carolinensis n. sp.

Body reddish, legs yellowish; soft parts white. Body one and two-thirds as long as broad, much narrowed in front, broadly rounded behind. Dorsum smooth, without hairs, nor any on the hind margin. Leg i slender; leg ii noticeably thicker even in female, in the male the lower side of femur ii has two or three rows of several rounded tubercles; at tip of patella below is a sharp projection. The female has the anal plate very broad near base, narrower at base and narrowly rounded behind. The legs bear a few simple hairs.

Length 1.6 mm.

Several specimens from Black Mts., N. Carolina (W. Beutenmüller). I have figured the species on pages 59 and 60 of my "Treatise on Acarina."

Celænopsis americana n. sp.

Body one and a half as long as broad, narrowed in front, broadly rounded behind. Above and below smooth and shining; yellowish. Dorsum with many short fine hairs, two longer hairs each side on posterior margin near tip; two pairs above these on dorsum, one near middle,

the other toward tip; one long hair on each shoulder; on the anterior part of dorsum above second legs is an oblique dark mark. Venter with a groove each side reaching from stigmata obliquely backward and uniting behind anal opening and just before tip. The genital area of female is between the second and third pairs of legs; it is longer than broad, pointed on each side, rounded behind, almost truncate in front, and contains a diamond-shaped opening. There is a transverse ridge between coxæ ii. Leg i slender, ending in a number of stiff hairs; other legs larger and subequal in size. Palpi rather short.

Length .75 mm.

Taken from an Histerid beetle (*Hololepta* sp.) at Washington, D. C., and Indianapolis, Indiana (Blatchley). This species is figured on page 61 of my "Treatise on Acarina."

Seius quadripilis n. sp.

Pale yellowish. Body broadly oval. Dorsum smooth, with four long bristles, one on each shoulder, and a submedian pair behind, also a pair of much smaller bristles on the anterior margin over the mouth-parts. Each long bristle about one-third the length of the body. Legs short and well forward, with only a few hairs, tarsi very slender. Peritreme long, reaching forward in front of coxæ ii. Sternal shield in male very broad, in fact as broad as long, and united behind to the large ventral shield; in the female there is a quadrate genital shield, about as broad as the sternal, and just behind it is the large subtriangular anal shield, also as broad as sternal shield. Behind coxa iv there are on each side two elongate metapodia.

Length .4 mm.

On orange leaves, Eustis, Florida (Swingle). It is figured on page 58 of the "Treatise."

Laelaps mexicanus n. sp.

Pale yellowish. Body elliptical, a little narrowed in front, barely tapering behind. Dorsum smooth, with about sixty stout short bristles, rather broader at tip than on base, and serrate on the apical half of one side. These bristles are arranged in about six longitudinal rows; the two terminal bristles are longer than the others. The legs are quite short leg iv about as long as the body, the others shorter, all with short, simple hairs. Peritreme long and slender. Ventral plate of female broken, only at coxæ iv. On the anal plate are three bristles each side of the anus, a pair behind, and a median one at tip.

Length .5 mm.

From Guanajuato, Mexico (Dugès); with some Coccid material; 12 Aug., 1889. This species is figured on page 58 of the "Treatise."

Laelaps macropilis n. sp.

Pale yellowish. Body elliptical, rather bluntly rounded behind, not narrowed in front. Dorsum irregularly pitted and roughened; provided in the cephalic part with about twelve bristles, short, and not very conspicuous, four in a sub-median row each side; behind with ten very large and long bristles, as long as half the width of body, four pairs of them sub-marginal, the other pair sub-central. Legs rather slender, the hind pair longer than the body, the fore pair nearly as long, the tarsi very slender; all legs provided with quite long fine hairs. Ventral shield of male almost covering entire venter, much broadened behind hind coxæ.

Length .4 mm.

On water hyacinth, Eustis, Florida (Webber). It is figured on page 59 of the "Treatise."

Dinychus americanus n. sp.

Color yellowish, legs paler. Body sub-pyriform. Dorsum densely strewn with sub-circular pits, those in the median area smaller than the others, those on the sides plainly larger than in the European *D. inermis*. Epistoma rather broader at tip than at base, and broadly rounded. Seen from above there is on each side a slight projection between legs i and ii. The peritreme at first runs nearly straight, then bends back on inner side, then curves forward some distance parallel to coxæ ii. Legs slender, short, tarsi long, and ending in a long caruncle. The nymph has a slender sternum, even more slender than in *D. inermis*.

Length .5 mm.

College Station, Texas, in cotton-seed meal. It is figured on page 63 of the "Treatise."

Pigmephorus americanus n. sp.

Pale yellowish. Body sub-oval, almost truncate behind. Dorsum smooth; about 8 long stiff bristles on each side margin, somewhat imbricated; posterior part of dorsum with a sub-marginal row of three long bristles on each side, also a dorso-humeral bristle, and a pair in front, rather widely separate. Segmentation of abdomen quite distinct in middle, not seen on margins. Legs rather slender, but short; with many hairs. The claws of leg i sunken under an apical projection of the tarsus other claws exserted.

Length .25 mm.

Several specimens taken from a fly (*Platycnemis imperfecta*) in the District of Columbia (No. 6984). It is figured on page 77 of the "Treatise."

Disparipes americanus n. sp.

Pale yellowish, anterior border of body hyaline. Anterior part of body semi-circular, posterior part rather more elongate but broadly rounded behind. A long, stout humeral bristle, and four on each posterior side-margin. Legs short and stout, pair iv stouter than others, the

upper edge of femur iv concave, tarsus iv tipped with four long bristles, a longer bristle on the preceding joint above, also one below, and one on tibia above; other tarsi with two claws and a stout branched hair below.

Length .15 mm.

One specimen from a bee (*Halictus venabilesii*) from Vernon, British Columbia, September, given me by Mr. E. S. G. Titus. It is figured on page 77 of the "Treatise."

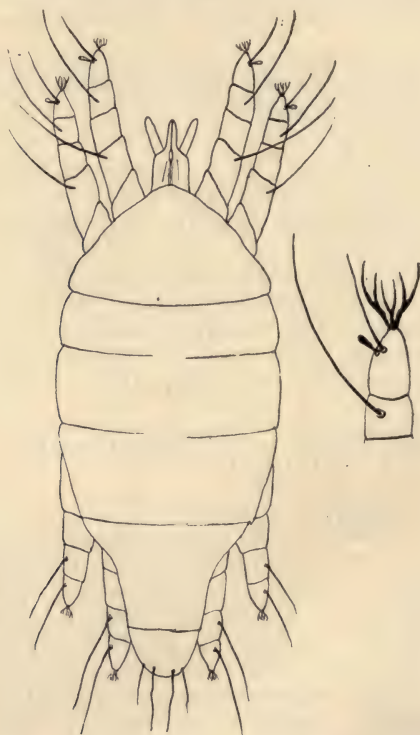


FIG. 16.—*Siteroptes carnea*: dorsal view, and tip of leg.

Siteroptes carnea n. sp.

Bright red. Body about two and one-half times as long as broad sides subparallel; beak moderately long and slender; palpi reaching to tip of beak. Dorsum with about five transverse divisions; the first, separating the cephalothorax, the most distinct; posterior part of abdomen much narrowed and tapering to a rounded tip. No bristles visible above, except two each side at tip of body. Legs stout; hind pairs

remote from front pairs; i and ii rather longer than the others; each with a few long bristles, mostly toward tip; tarsi ending in three forked claws; tarsi i and ii with a short clavate hair above near tip.

Length .28 mm.

Occurs in enormous numbers in the deformed heads of certain grasses (*Spirobolus*) in New Mexico and Utah, and doubtless elsewhere in the West.

Phyllocoptes cornutus n. sp.

Color reddish. Body broad, scarcely two and one-half times as long as broad at base of abdomen, moderately convex. Cephalothorax apparently smooth, produced forward in a broad, median plate, with an acuminate point; this plate when seen in side view looks like a frontal horn.

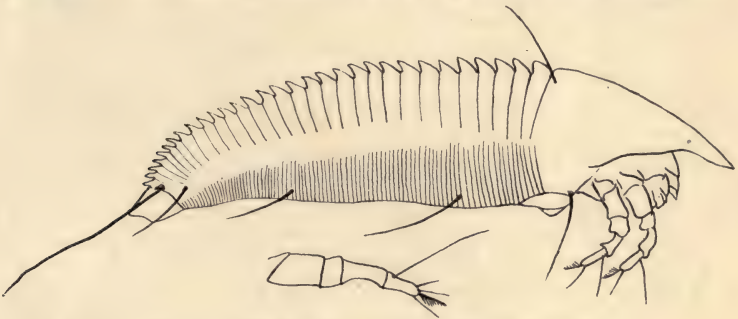


FIG. 17.—*Phyllocoptes cornutus*, and leg i enlarged.

Near the posterior margin of cephalothorax there is a sub-median pair of bristles, not one-half as long as the cephalothorax. Abdomen with about 32 dorsal rings, and fully twice as many ventral ones. Terminal bristles about one-fourth as long as body; three pairs of ventral bristles; one near tip, one before, and one behind middle, first pair longest; also a long pair from coxæ ii. Legs as usual; the long tarsal bristle arises near the base of that joint, but not at extreme base.

Length .13 mm.

On leaves of peach, Washington, D. C. This species lives free on either surface of peach leaves in various parts of the Eastern States. When in numbers it produces a sort of silvery sheen upon the leaf, readily discernible when the light is shining upon it.

Cecidobia n. gen.

An Eriophyid. Dorsal abdominal rings numerous and deeply cut; ventral segmentation almost obliterated; cephalothorax pointed in front, and from the lower median surface there extends downward a curved, black, stiff, rod-like bristle; tarsi ending in a stiff branched hair. Venter with four pairs of bristles, besides longer apical bristles.

Type: *C. salicicola* n. sp.

Differs from all known Eriophyidæ by the prominent median black bristle in front; a most remarkable character, and I know of no explanation of its use. In some species of Epi-trimerus the beak is greatly elongated, but this genus can be distinguished at once from Cecidobia by having the dorsal rings as numerous as ventral ones.

Cecidobia salicicola n. sp.

Dull yellowish. Body broad and short, not three times as long as broad at shoulders. Cephalothorax smooth, triangularly produced in front, a pair of short porrect bristles in front, and a pair of very large and long bristles behind, one near each posterior corner of cephalothorax, and each nearly as long as the body; abdomen with about 35 or 40 deep



FIG. 18.—*Cecidobia salicicola*.

rings above, extending down but a little way on sides; the telson short; apical bristles fully one-half the length of body. Ventral segmentation obscure, a few fine lines in certain lights, no indentations of margin; four pairs of moderately long bristles below; the second and fourth pairs longer than others, and the second more widely apart at base; a pair of still longer bristles from coxæ ii; dorsal tarsal bristle long, and arising from base of the joint.

Length .10 mm.

Many specimens found in groups of 3 to 10 within recesses of a gall on willow from Ward, Colorado (Cockerell). The gall extends above both surfaces of the leaf, yet not very high.

NOTES ON SCOLYTID LARVÆ AND THEIR MOUTH
PARTS.

BY A. D. HOPKINS, PH. D.

In the study of forest insects, and especially in that relating to experimental work with girdled and felled trap trees, it is of the greatest importance to be able to identify the species from the immature stages, yet the published results of accurate work on the larvæ of American Scolytidæ and other important groups of insect enemies and friends of forest trees and their products, is so meager that it is practically of no use to us in our field work. Therefore, it has been necessary to take up the study of the larvæ of the more important species, with a view of preparing tables of characters, for their identification.

The identification of good specific characters of the adults to tabulate for their identification has given me so much trouble and occupied so much time that heretofore it has seemed a hopeless task to undertake systematic work on the larvæ and pupæ, but, in working up material for a monograph on the genus *Dendroctonus*, it became necessary to study the larva, and the results have been so satisfactory that the prospect for success in future studies of the larvæ of other genera and groups is quite encouraging.

The Scolytid larva is of the simple legless type, with slight variation in general appearance; the body segments are rarely with chitinous plates, and, while the living examples present some distinctive characters of form and pubescence, these are obscure and usually lost in alcoholic specimens. Therefore, it was realized that any character, to be of special value, must be found in such chitinous parts as would be readily preserved in alcohol, in cast skins in the pupal chambers, and in dry specimens. This led me to give special attention to the head and mouthparts and other chitinous parts of the body, and has resulted in the determination of some very good characters in *Dendroctonus* and other larvæ. Their value in classifying the species of the genus into natural divisions and series was indicated when, upon tabulating them, I found that the larval characters referred the species into practically the same positions as had the imago characters, and, if anything, had indicated even better natural affinities. This was also verified by the secondary sexual and pupal characters and the characteristics of work and habits, all of which have been tabulated.

The larvæ of thirteen out of nineteen known species of *Dendroctonus* are included in the table of characters. According to these, the species fall naturally into two primary divisions and four sub-divisions, characterized as follows: In the first division, including nine species, the 8th and 9th abdominal segments are without dorsal plates, while in the second division, including four species, they have distinct plates. The first division is further separated by the presence or absence of an elevated ridge near the anterior margin of the epistoma, but the most important character to designate the species is the absence or presence of a frontal elevation and the form and general character of the latter.

In the first sub-division of the second division the dorsal plates of the 8th and 9th abdominal segments are unarmed, while in the second subdivision they are armed with prominent teeth. The more important characters separating the species are found in the frontal area, the clypeus and labrum, all of which are readily observed and recognized in dried specimens, when pinned or mounted on card points. Indeed, if the larvæ are properly treated, even the softer parts are nicely preserved in the dried specimens.

Another character which is of value in separating some of the species is the presence or absence of foot scars on the ventral lobes of the thoracic segments.

In the literature on coleopterous larvæ the mentum, maxillæ, and mandibles have received special attention, while the labrum and the taxonomic importance of its structure and variable parts, has not received the attention it seems to deserve. Packard, in his *Text Book of Entomology*, appears to be the first to call attention to the importance of the epipharynx, especially in coleopterous larvæ, and expresses surprise that this structure has been overlooked by so many leading entomologists. Considerable information has been published concerning the labrum of insects, especially in its relation to the segments of the head, but as in the general subject of head segmentation, there is a wide range of opinions and conclusions.

In the labrum of the Scolytid larvæ, as in that of representatives of a number of other families of Coleoptera that I have examined, there is a pair of chitinous ventral structures which are of especial interest (Plate IV, Fig. 8). They are attached to, and sometimes extend through, the dorsal exoskeleton of the labrum. In some species they appear on the dorsal surface as black or dark tubercles, which were noted by Heeger in 1854 in certain curculionid larvæ, and briefly referred to and figured in his natural history of insects.

In a longitudinal section, these parts appear as stout, chitinous hooks, resembling somewhat the mandibular hooks in dipterous larvæ—thus they may be referred to as labral hooks. This structure presents some striking variations or modifications in different families, groups, genera, and even in allied species of the same genus. In Scolytidæ there is a striking difference in the structure and form of the clypeus, labrum, and labral hooks in representatives of different genera, primary groups, and sub-families. In *Dendroctonus* (Plates IV and V), the clypeus and labrum are separated by a distinct suture, and the latter appears to be capable of articulation. The labral hooks are prominent in some species and extend back to the base of the clypeus, while in others they are very short, and do not extend to the base of the labrum. In *Platypus* and *Crassotarsus* (the two principal genera of the sub-family Platypodinæ) the clypeus appears to be completely divided and widely separated by the labrum, which occupies a median position and is firmly attached to the epistoma, or second clypeus (Plate V); the apex scarcely extends beyond the apical angles of the first clypeus, from which it is separated by a deep, narrow emargination. The labral hooks appear to be modified into parallel sclerites between the labrum and clypeus, and firmly attached to the second clypeus. The ventral portion of this combination structure is chitinous, strongly convex in the middle, and closely, obliquely sulcate each side, while towards the base it is deeply concave.

In the *Corthyli* group (sub-family Scolytinæ), including *Corthylys*, *Pterocyclon* (*Monarthrum*), *Tripodendron* (*Xyloterus*), the structure of the clypeus and labrum is intermediate between the *Hylesinæ* and *Platypodinæ*, in the fact that the anterior margin of clypeus is obscure or completely coalesced with the labrum, and the labral hooks are parallel.

In *Scolytus muticus* (which, at present, represents another sub-family) the clypeus and labrum are separated by a distinct suture, and the labral hooks extend from the middle of the latter to the middle of the former, curving outward towards the base (Plate V).

There is another feature of the labral hooks exhibited in some species, where the anterior ends appear to be jointed. In *Dendroctonus terebrans* they are also articulated with another pair of similar structures, which appear to belong to the pharynx.

As previously noted, there is a remarkable resemblance between these labral hooks and the mandibular hooks in certain dipterous larvæ. They also appear to be representative of primitive appendages. Perhaps, after all, the labrum may represent a primary first segment or head. At any rate, the

labrum and other parts of the anterior area of the larval head, including the epipharynx, possess certain features common to such a wide range of species, that they must be recognized, especially in the coleopterous larvæ, as possessing characters of prime importance for future systematic work, and, it seems to me, offer a rich field for original research.

EXPLANATION OF PLATE IV. MOUTHPARTS OF SCOLYTIDÆ.

1. Head of Larva (*Dendroctonus ponderosæ*), dorsal view.
2. Same—ventral view.
3. Same—oral view.
4. Same—lateral view.
5. Same—front, clypeus and labrum.
6. Maxillæ of *D. valens*, showing first and second with muscular structures.
7. Front, clypeus and labrum of *D. terebrans*.
8. Front, clypeus and labrum anatomy of *D. valens*.
9. Front, epistoma and labrum of adult *D. brevicornis*, var. *barberi*.

ABBREVIATIONS.

a. ang.	Anterior angle of mandible.
ac.	Antecoxal piece.
ant.	Antenna.
ap.	Apical palpi of epipharynx.
b. rdg. e.	Basal ridge of epistoma.
b. rdg. m.	Basal ridge of mandible.
b. tub.	Basal tubercle of mandible.
Cl.	Clypeus.
C. 1.	1st Clypeus.
C. 2.	2d Clypeus.
c.	Cardo.
d. art. of m.	Dorsal articulation of mandible.
E.	Epicranium.
epi.	Epipharynx.
est.	Epistoma.
esu.	Epicranial suture.
F.	Front.
fl or ap.	Fontenal (or apex) of frontal area.
fs.	Frontal suture.
G.	Gena.
Gu.	Gula.

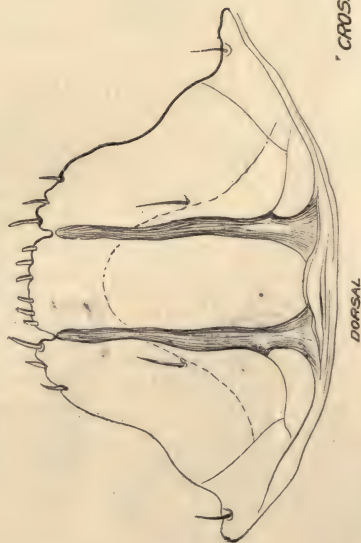
LABRUM OF SCOLYTID LARVAE.



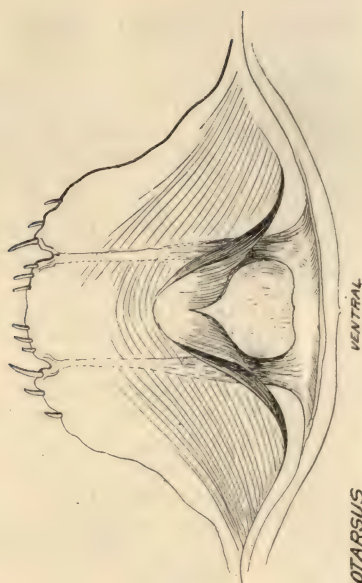
DENDROCTONUS PONDEROSAE



SCOLYTUS MUTICUS



DORSAL



VENTRAL

CROSSOTARSUS

hyp.....	Hypopharynx.
I, ang.....	Inner angle of mandible.
L.....	Labrum.
l.....	Lacinia.
lh.....	Labral hooks.
l. art.....	Labral articulation.
lig.....	Ligula.
Md.....	Mandible.
m. sh.....	Mandible sheet.
mx.....	Maxillary foramen.
1st. mx.....	1st Maxilla.
2d. mx.....	2d Maxilla, or labium.
O.....	Occiput.
of.....	Occipital foramen.
oe.....	Oesophagus.
p.....	Palpiger.
pl.....	Palpus.
sm.....	Sub-mentum.
sti.....	Stipes.
te.....	Taste palpi.
v.....	Vertex.

SOME NOTES ON THE PROVANCHER MEGACHILIDÆ.

By E. S. G. TITUS.

Through the kindness of Abbé V. A. Huard, Curator of the Museum of the Department de l'Instruction Publique, Quebec, Canada, I have had the opportunity of examining the specimens of the Megachilidæ (now in the Museum at Quebec) upon which Abbé Provancher based his determinations.

These specimens have been compared with the Cresson and other types at Philadelphia and with the collections in the National Museum at Washington.

The only references given are those of Abbé Provancher's articles and such others as directly relate to his writings.

The types of the new species unless otherwise stated are in the Museum at Quebec.

MEGACHILINÆ.

Megachile relativa Cresson.

1882: Le Naturaliste Canadien, v. XIII, p. 227, 232, n. 12, ♀ (Megachile optiva in part).

1883: Fauna Ent. Can. Hym. p. 710, 715, n. 12, ♀ (*Megachile ptiva* in part).

1888: Add. Fauna Ent. Can. Hym. p. 462 (*Megachile optiva* in part).

1898: Dalla Torre, Cat. Hym. v. X, p. 438, ♀ (Provancher references to *M. optiva* in part.)

One of the two female specimens under the number 877 appears to be referable to Cresson's *relativa* and has been compared with the type.

The clypeus is slightly emarginate, mandibles apparently 4-toothed slightly interrupted band on dorsal abdominal segment 4, bands widely, interrupted on segments 2 and 3, missing on first segment (rubbed), edges of abdominal segments with dense pubescence; tarsal claws each with a sharp basal tooth. Recorded by Provancher from "St. Hyacinth, Cap Rouge, etc."; it is of course impossible to determine from which of these localities the above specimen was taken.

Megachile leoni n. sp. ♀.

Same references as above given under *Megachile relativa* apply to this species, the specimen upon which it is founded being the other specimen of "*Megachile optiva*" in the Provancher collection. In general appearance it is near to *relativa*.

Length 9 mm. Pubescence of the insect white and yellow mixed (specimen very dirty); not as dense or as long on the clypeus as elsewhere, dorsal abdominal bands present and entire except on first segment which has the band slightly interrupted, last dorsal segment with rather long black pubescence, other dorsal segments with scattering black hairs on the disk, pubescence of scopa coarse, short and yellow, of tarsi bright orange; punctuation close and coarse, on clypeus not so close nor so deep as on remainder of head; mandibles 5-dentate, teeth obsolete and irregular; clypeus entire; tegulæ fuscous, wings slightly embrowned, transverse nervure before basal nervure; last two joints of front tarsi reddish, all the spurs reddish yellow, front claws with a distinct basal tooth; hind claws without, middle legs broken, first tarsal joint on posterior legs flattened, scarcely as broad at tips as at base, not subparallel.

Cypophaga inermis Provancher.

1882: Le Naturaliste Canadien, v. XIII, p. 226, 229, n. 6, ♂ (*M. simplex* Prov.)

1883: Fauna Ent. Can. Hym. p. 710, 712, n. 6, ♂ (*M. simplex* Prov.)

1888: Add. Fauna Ent. Can. Hym. p. 323, n. 6, ♂, p. 462, (*M. inermis* Prov.)

1896: Dalla Torre, Cat. Hym. v. X, p. 449 (*M. simplicissima* D. T.)

This species is very closely related to *M. montivaga* Cresson and I have deemed it advisable to give a rather full description of the one specimen. The species was first named *M. simplex* by Abbé Provancher, but in 1888 he renamed it *M. inermis*, doubtless having become aware that Smith in 1853 had also described a *M. simplex*. Dalla Torre evidently overlooked this name *M. inermis* and renamed the species *M. simplicissima*.

Form subparallel; pubescence mostly white, some black hairs on upper part of cheeks near eyes and on dorsal abdominal segments where it is rather dense, pubescence of thorax white somewhat mixed with ochraceous on the dorsum, face and cheeks with long white hairs, tarsi clothed with yellowish pubescence, dorsal abdominal bands close and appressed, absent on first segment, widely interrupted on second segment (rubbed?), first and second segments clothed with a loose gray pubescence; punctuation regular and close, that on scutellum exceedingly close rather large and with the ground surface tessellated; head very broad and extending well behind the eyes, antennæ simple, with a tendency to be crenulated beneath, fuscous beneath; mandibles long, subparallel, black with a red band across outer tooth and on inner teeth at tips, 3-toothed, first tooth long and sharp, middle tooth shortest, a long, flattened, rounded and turned inward at tip, basal tooth, cheeks apparently not armed; labrum truncate at tip (in *pugnata* it is notched); tegulæ reddish-black; a central smooth slightly elevated line on anterior mesothorax, wider posteriorly and reaching almost from tegulæ to apical margin; transverse nervure interstitial; femora reddish inside; claws cleft, with an enlargement but no basal tooth; 6th dorsal segment with a prominent carina, shallowly, broadly emarginate, apical carina thin and almost obsolete, lateral teeth flattened in axial plane of body and bent inward, round at tip, 7th segment produced and with a faint emargination at tip; no coxal spines.

Redescribed from one ♀ specimen numbered 873, and recorded by Provancher.

Megachile vancouverensis Provancher. ♂.

1888: Add. Fauna Ent. Can. Hym. p. 425, n. 3, p. 457.

1896: Dalla Torre, Cat. Hym. v. X, p. 451.

In shape very much like *M. avara* Cresson, but is wider, has more pubescence on abdomen, thus making it appear grayer.

Pubescence long and white, mixed with brown on the vertex and on front of thorax almost back to tegulæ, short black hairs on outer orbits of eyes, reaching about half way from vertex to base, cheeks back of this portion have some black hairs mixed with short white ones, segments 3, 4, 5 with more or less brown or black hairs on dorsum; middle tarsi densely clothed above and hind tarsi beneath with short yellow pubescence, some black hairs above on all the tibiæ; pubescence of all the femora long and white, first four joints of tarsi fringed with long white hairs, some of which have brown tips, first joint concave, yellowish red

beneath, darker above, with the upper edge quite black, each margin fringed with short coarse brownish red hairs, second, third and fourth joints with short coarse hairs on edges, all of the joints have short flattened lobes projecting beyond the apex, claw joint ferruginous as long as three before it combined, claws black at base of cleft, tips ferruginous; anterior coxæ with well developed black spines, tipped with red, subapical spines ferruginous, trochanters and coxæ black; front and middle femora slightly swollen, all the femora reddish beneath, the first with the portion where the tibia rests when closed against it smooth and highly polished, yellowish-red, front tibiæ same color as femora, also polished and with a marginal fringe of white hairs; punctures of head and thorax rather fine and close, on abdomen sparse; antennæ black, last joint flattened but not expanded; mandibles 4-toothed, straight above, toothed below at base, black, punctured, inner and outer teeth with reddish marginal lines; clypeus with very fine punctures, edge impunctate, polished, with a central emargination and having on each side two teeth; second joint of labial palpi slightly longer than first; maxillary palpi 3-jointed, bare, basal joint broadest, a white bristle at tip of third joint, this joint tapers from base to tip; 6th dorsal abdominal segment with a compressed carina, broadly, shallowly emarginate, edges slightly broken or irregularly serrate, apical carina thin with two long rounded distant teeth, 7th segment not at all visible; cheek armed with a scale-like process.

Redescribed from one specimen numbered 1417 and reported by Provancher to have been received from "Vancouver (Taylor)." This is a very peculiar species and does not belong in *Megachile* s. str.

Anthemois addenda Cresson.

1888: Add. Fauna Can. Ent. Hym. p. 462 (*acuta* given as syn. of *latimanus*).

I have examined one ♀ labelled *Megachile acuta* and presume that the above reference is to this specimen. The specimen is numbered 1113 and also bears the number 188. It is distinctly referable to Cresson's *M. addenda*.

Anthemois infragilis Cresson.

1883: Le Naturaliste Canadien, v. XIV, p. 37, n. 5, ♂ (*Osmia frigida*).

1888: Add. Fauna Can. Ent. Hym. p. 325, ♂, 462 (*Osmia frigida*).

1896: Dalla Torre, Cat. Hym. v. X, p. 395 (*Osmia frigida*, Prov. references, ♂ only). I have examined one specimen of this species, numbered 1061 and labelled *Osmia frigida*. It is a typical specimen of Cresson's *infragilis*. Provancher in 1888, in his references to the above species on p. 324, described the female, but I have not seen the specimen nor can I recognize it from his description.

[TO BE CONTINUED.]

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SOME NOTES ON THE PROVANCHER MEGACHILIDÆ.

By E. S. G. TITUS.

[Continued from page 152.]

Xanthosarus vidua Smith.

1882: Le Naturaliste Canadien, v. XIII, p. 226, 227, n. 3, ♂ (*M. scrobiculata*); p. 226, 230, n. 8, ♀ (*M. grandis*); p. 227, 240-241, n. 10 (*M. centuncularis*).

1883: Fauna Ent. Can. Hym. p. 710, 711, n. 3, ♂ (*M. scrobiculata*); p. 710, 713-714, n. 8, ♀ (*M. grandis*); p. 710, 714-715, n. 19, ♀ (*M. centuncularis*);

1888: Add. Fauna Ent. Can. Hym. p. 462 (species as above noted).

1896: Dalla Torre, Cat. Hym. v. X, p. 425 (*M. centuncularis*, Prov. references); p. 445 (*M. scrobiculata* as syn. of *pugnata*, Prov. references); p. 444 (*M. grandis* under *M. pollicaris* Prov. references).

The specimen marked *M. grandis* is numbered 874 and the locality at present unknown. The ♂ marked *M. scrobiculata* bears the number 871 and it also has no known locality at present. One ♀ numbered 876 and labelled *M. centuncularis* is doubtless from Provancher's locality "CC." I have not added above in the references to *M. centuncularis* the following two as I have no means of knowing to what species he refers.

1877: Le Naturaliste Canadien, v. IX, p. 23, 95.

1886: " " v. XVI, p. 34.

Xanthosarus melanophæa Smith.

1882: Le Naturaliste Canadien, v. XIII, p. 226, 228, n. 4, ♂ (*M. femorata*), p. 227, 232, n. 13, ♀ (*M. melanophæa*).

1883: Fauna Ent. Can. Hym. p. 710, 712, n. 4, ♂ (*M. femorata*); p. 710, 715-716, n. 13, ♀ (*M. melanophæa*).

1888: Add. Fauna Ent. Can. Hym. p. 462 (species as noted above).

1896: Dalla Torre, Cat. Hym. v. X, p. 420 (*M. femorata*, Prov. references); p. 438 (*M. melanophæa*, Prov. references).

1903: Friese, Zeits. Hym. Dip., v. III, p. 248 (*M. canadensis*).

The specimen labelled *M. femorata* is numbered 872, locality unknown, the ♀ labelled *M. melanophæa* is numbered 878 and is from "C."

Xanthosarus femorata Smith.

1882: Le Naturaliste Canadien, v. XIII, p. 226, No. 27, n. 1, ♂ (*M. latimanus*).

1883: Fauna Ent. Can. Hym. p. 710-711, n. 1, ♂ (*M. latimanus*).

1888: Add. Fauna Ent. Can. Hym. p. 462 (*M. latimanus*).

1896: Dalla Torre, Cat. Hym. v. X, p. 436 (*M. latimanus*, Prov. references, ♂ only).

One specimen numbered 870, labelled *M. latimanus* appears to be referable to *X. femorata* Sm. It is from either St. Hyacinth or Cap Rouge as Provancher reports the species from both localities.

I have not added above the reference to the ♀ of *latimanus* given by Provancher because I have seen no specimens so labelled.

1888: Add. Fauna Ent. Can. Hym. p. 324, n. 9, ♀ (*M. latimanus*). Nothing can be told from the description, which appears to be founded on some *Xanthosarus*.

Xanthosarus latimanus Say.

1882: Le Naturaliste Canadien, v. XIII, p. 226, 227-228, n. 2, ♂ (*M. frigida*); p. 227, 231, n. 11, ♀ (*M. mendica*).

1883: Fauna Ent. Can. Hym. p. 710, 711, n. 2, ♂ and ♀, p. 710, 715, n. 11, ♀ (as above).

1888: Add. Fauna Ent. Can. Hym. p. 462, (*M. frigida* and *M. mendica*).

1896: Dalla Torre, Cat. Hym. v. X, p. 431, ♂ (*M. frigida*, Prov. references); p. 439, ♀ (*M. mendica*, Prov. references).

Megachile frigida is reported by Provancher from St. Hyacinth and *M. mendica* from Chicoutimi. A specimen labelled *M. frigida* bears the number 1012 and one labelled *M. mendica* is numbered 1013.

Sayapis, new name for *Gnathocera* and *Ceratias* both preoccupied.

1882: Le Naturaliste Canadien, v. XIII, p. 232 (*Gnathocera*, type cephalica).

1883: Fauna Ent. Can. Hym. p. 689, 716 (*Gnathocera*, type *cephalica*).

1888: Add. Fauna Ent. Can. Hym. p. 323 (same ref.)

1896: Dalla Torre, Cat. Hym. v. X, p. 417 (as a syn. of *Megachile*).

1903: Robertson, Tr. Amer. Ent. Soc. v. XXIX, p. 167, 172 (*Ceratias*, type *pugnata*).

It is rather unfortunate that this genus should have had two preoccupied names given to it. *Gnathocera* was used by Kirby in 1825 for a genus of Coleoptera; *Ceratias* was used by Kroy in 1845 for a genus of Fishes.

Sayapis pugnata Say.

1882: Le Naturaliste Canadien, v. XIII, p. 233, ♀ (*Gnathocera cephalica*); p. 226, 228-229, n. 5, ♂, ♀ (*M. pugnata*).

1883: Fauna Ent. Can. Hym. p. 710, 712, n. 5, ♂ ♀ (*M. pugnata*); p. 716, ♀ (*Gnathocera cephalica*).

1888: Add. Fauna Ent. Can. Hym. p. 323, n. 5, p. 462 (makes *G. cephalica* a syn.).

1896: Dalla Torre, Cat. Hym. v. X, p. 445 (*M. pugnata*, Prov. references and *G. cephalica* which he makes a syn. of *pugnata*).

I have seen but one pair of this species, they are numbered 196 (or 961). Provancher reports the species from Cap Rouge. It is of course impossible to state which of the references are applicable to these particular specimens, but since Provancher himself made *Gnathocera cephalica* a synonym of *M. pugnata* we may feel assured that the originals were carefully compared.

OSMIINÆ.

Osmia lignaria Say.

1882: Le Naturaliste Canadien, v. XIII, p. 207-208, n. 1, ♀, ♂.

1883: Fauna Ent. Can. Hym. p. 707, 708, n. 1, ♀, ♂.

1888: Add. Fauna Ent. Can. Hym. p. 466.

1896: Dalla Torre, Cat. Hym. v. X, p. 410, ♀ (Provancher references).

I have examined ♀ ♀ numbered 867 and labelled *Osmia lignaria*. No specimens of the ♂ were seen.

Osmia simillima Sm.

1883: Fauna Ent. Can. Hym. p. 812, n. 6, ♀ (*Osmia atriven-tris*).

1888: Add. Fauna Ent. Can. Hym. p. 466 (*Osmia atriven-tris*).

1896: Dalla Torre, Cat. Hym. v. X, p. 385, ♀ (*Osmia atriventris*, Prov. references).

One ♀ specimen bearing the number 1066 and marked *Osmia atriventris* belongs to *Osmia simillima* ♀. I have had opportunity of consulting Prof. Cockerell's notes made on an examination of the type of *O. simillima* in the British Museum and am satisfied that this specimen belongs to that species. Provancher gives Toronto as the locality of capture.

Osmia atriventris Cresson.

1882: Le Naturaliste Canadien, v. XIII, p. 207, 208, n. 2, ♀ (*O. simillima* in part).

1883: Fauna Ent. Can. Hym. p. 707, 708, n. 2, ♀ (*Osmia simillima* in part).

1888: Add. Fauna Ent. Can. Hym. p. 325, ♀, p. 466, (*Osmia simillima* in part); p. 325, 329, n. 15, ♂, p. 467 (*Osmia vicina*).

1896: Dalla Torre, Cat. Hym. v. X, p. 410, ♀ (*O. simillima*, Prov. references); p. 414, ♂ (*O. vicina*, Prov. references).

A specimen numbered 1161 and labelled, not with the regular oblong label used by Provancher, but on a narrow strip, *Osmia simillima*, can be referred to this species. Provancher reports *O. simillima* from "C." A ♂ numbered 1162, and labelled *Osmia vicina* appears to be the ♂ of *atriventris*. Provancher reports *O. vicina* from Ottawa at flowers of *Cypripede*. The ♀ is also listed by Provancher in 1888 under n. 15, but I have not seen the specimen.

Osmia brevis Cresson.

1888: Add. Fauna Ent. Can. Hym. p. 324, 326, n. 8, ♀, p. 466.

1896: Dalla Torre, Cat. Hym. v. X, p. 388. (Provancher references only).

One ♀ numbered 868 and correctly determined. Reported from Cap Rouge by Provancher.

Osmia nigrifrons Cresson.

I have examined one ♀ of this species in the Provancher material numbered 1526 and labelled *O. nigrifrons*.

Melanosmia grandior Ckll. (*Osmia longula* Prov).

In the Provancher material sent me there is a ♀ numbered 1525 and 13, and labelled *Osmia longula*, which is referable to Cockerell's *O. grandior*.

Chalcosmia chalybea Smith.

1888: Add. Fauna Ent. Can. Hym. p. 325, 326, n. 10, p. 466 (*Osmia faceta*).

1896: Dalla Torre, Cat. Hym. v. X, p. 394 (*O. faceta*, Provancher references).

One ♀ specimen numbered 1160 and labelled *Osmia faceta* has been compared with Smith's description and Cockerell's MS. notes on the type of *O. chalybea* and is undoubtedly that species. Provancher records his species from Cap Rouge.

Leucosmia albiventris Cresson.

1882: Le Naturaliste Canadien, v. XIII, p. 207, 208, n. 2, ♀ (*O. simillima* in part).

1883: Fauna Ent. Can. Hym. p. 707, 708, n. 2, ♀ (*O. simillima* in part).

1888: Add. Fauna Ent. Can. Hym. p. 325, ♀, p. 466 (*O. simillima* in part); p. 325, 327, n. 11, ♀ p. 466 (*O. albiventris*).

1896: Dalla Torre, Cat. Hym. v. X, p. 384, ♀ (*O. albiventris*, Prov. references); p. 410, ♀ (*O. simillima*, Provancher references).

One ♀ numbered 1161 and labelled *Osmia simillima* is referable to this species as is also a ♀ correctly labelled and numbered 1163. *O. albiventris* is recorded by Provancher from Cap Rouge. The ♂ which he records I have not seen.

Leucosmia parvula Dalla Torre.

1882: Le Naturaliste Canadien, v. XIV, p. 37, n. 7, ♂ (*Osmia parva*).

1883: Fauna Ent. Can. Hym. p. 812, n. 7, ♂ (*O. parva*).

1888: Add. Fauna Ent. Can. Hym. p. 325, n. 7, ♂. 467 (*O. parva*).

1896: Dalla Torre, Cat. Hym. v. X, p. 405, ♂ (*O. parvula*, n. n. for *parva*).

Length 4.5 mm. Small, blue-green, legs and antennæ reddish fuscous; pubescence very white, that on face and thorax very dense, sides of abdomen fringed, first and second dorsal abdominal segments with scant pubescence, front femora and tibiae with long white fringe, not so dense and shorter on other legs; punctuation fine and close, mandibles very dark, two-toothed, spurs dark red, tegulae reddish; basal nervure before transverse median; claws deeply cleft; 6th and 7th dorsal abdominal segments deeply incised at apex, edge of 6th segment slightly turned up and ferruginous along the thin edge, the blue color of the segment runs out onto the points of the teeth, thus interrupting the ferruginous edge.

Redescribed from one ♂ specimen numbered 1062 and labelled *Osmia parva*. This is a very small species, very dainty in shape. No locality is given for the species. This was renamed by Dalla Torre on account of Radoszkowski's species *parva* 1874.

Monilosmia canadensis Cresson.

1888: Add. Fauna Ent. Can. Hym. p. 325, 329-330, ♂ p. 466 (*Osmia proxima*).

1896: Dalla Torre, Cat. Hym. v. X, p. 496 (*O. proxima*, Provancher references).

One ♂ specimen numbered 1164 and labelled *O. proxima*. Provancher reports the species from "Ottawa (Guignard)."

Centrosmia bucephala Cresson.

1882: Le Naturaliste Canadien, v. XIII, p. 207, 208, n. 3, ♀ (*O. lignicola*).

1883: Fauna Ent. Can. Hym. p. 707, 708, n. 2 (*O. lignicola*).

1888: Add. Fauna Ent. Can. Hym. p. 324, 466 (*O. lignicola*); p. 325, 327-328, n. 13 (*O. latitarsis*).

1896: Dalla Torre, Cat. Hym. v. X, p. 399 (*O. latitarsis*, Provancher references); p. 491, ♀ (*O. lignicola*).

The type of *O. lignicola* is numbered 965 and Provancher records it from Cap Rouge, the species *O. latitarsis* is numbered 1168, and is also from Cap Rouge.

Centrosmia tarsata Provancher.

1888: Add. Fauna Ent. Can. Hym. p. 325, 328, n. 14, ♂, p. 467 (*Osmia tarsata*).

1896: Dalla Torre, Cat. Hym. v. X, p. 412 (*Osmia tarsata*).

Length 9 mm. Rather slender, blue-black, abdomen shining blue, antennæ deep brown, head with a greenish cast in some lights, margins of all the dorsal abdominal segments brownish, polished, and not punctured, first two pairs of legs blue-black (hind legs missing) 2d ventral segment reddish with a tendency in the center of the apex towards an upraised tooth; pubescence of face white and dense, dorsum of thorax with pubescence somewhat ochraceous (has been wet and is matted on the surface), first two dorsal abdominal segments, head and pleura with white pubescence; edges of segments with scarce pubescence ochraceous and black intermixed, pubescence of legs white on tibiæ and ferruginous on tarsi; antennæ long rather slender, neither 3d nor 4th joint equals 1 + 2; mandibles polished, apical tooth very sharp; legs finely punctured, tarsi of middle legs deformed as in *C. bucephala* but are more slender and not so broadly deformed as in that species; outer spine of tibiæ long and sharp, somewhat curved, spurs dark, one much longer than the other on hind legs; 6th dorsal segment minutely emarginate in the central margin and slightly sinuate at sides, 7th segment notched sharply and deeply on apical margin, teeth pointed, 3d ventral showing in the form of lobes at the sides of and behind the 2d ventral which has a small upraised tooth on the center of its apical margin, 4th ventral with sides curved and tip broadly truncate; first submarginal cell nar-

rowed above, both recurrent nervures entering cell at about equal distances from apex and base, transverse median nervure only slightly before the basal nervure, veins brownish, wings slightly clouded.

The single ♂ is numbered 1169 and recorded by Provancher from Cap Rouge.

Nothomsia exigua (?) Cresson.

1888: Add. Fauna Can. Ent. Hym. p. 326, ♂ p. 339, 466 (*Osmia exigua*). No specimens of this species were sent for examination and it is very doubtful if the species was correctly recognized. The "*Osmia parva*" Prov. would come the nearest to the species of any specimens I have seen from Canada.

Monumetha albifrons (Kirby).

1837: W. Kirby, Fauna Bor.-Amer. v. IV, p. 270, n. 374, ♂.

1882: Le Naturaliste Canadien, v. XIII, p. 227, 240-241, n. 10 (*Megachile oblonga*).

1882: Le Naturaliste Canadien, v. XIII, p. 226, 230, n. 9, ♀ (*Megachile oblonga*).

1883: Fauna Ent. Can. Hym. p. 714, n. 9, ♀ (*Megachile oblonga*).

1888: Add. Fauna Ent. Can. Hym. p. 324, 326, n. 9, p. 467 (*Osmia oblonga*).

1896: Dalla Torre, Cat. Hym. v. X, p. 404, ♀ (*Osmia oblonga*).

There is in the Provancher collection the type of *Osmia oblonga* Prov., a single ♀ specimen numbered 962, that is a well marked specimen of Cresson's "*Monumetha argentifrons*," which species I now believe to be synonymous with Kirby's *Chelostoma albifrons*. This last named species was described from one male captured in latitude 65°, North America. I have recently examined specimens collected by Merritt Cary of the Division of Biological Survey, U. S. Department of Agriculture, at Ft. Resolution, Great Slave Lake, Mackenzie Ter., Dom. of Can., 26 June, 1903, which answers to Mr. Kirby's description so closely that I cannot do otherwise than consider them to belong to *albifrons*. Both ♀ ♀ and ♂ ♂ are represented and a comparison with other specimens of the genus *Monumetha* gives no good specific differences. It will be recalled that Mr. Cresson noticed the resemblance between his *M. borealis* (Great Slave Lake) and Kirby's species.

Monumetha imperfecta Provancher, 1896.

1896: Le Naturaliste Canadien, v. XXIII, p. 9, n. 1, ♀.

I have not seen the type of this species which was collected at Los Angeles, Cal., by Mr. D. W. Coquillett. The specimen

was sent to Abbé Provancher by Mr. Coquillett who does not now remember whether it was returned or not. From the description the species appears to be a specimen of *Monumetha albifrons* Kby.

Alcidamea simplex Cresson.

1882: Le Naturaliste Canadien, v. XIII, p. 207, 208, n. 4, ♀ (*Osmia buconis*).

1883: Fauna Ent. Can. Hym. pp. 707-708, n. 4, ♀ (*Osmia buconis*).

1888: Add. Fauna Ent. Can. Hym. p. 325, ♀ p. 466 (*Osmia buconis*).

1896: Dalla Torre, Cat. Hym. v. X, p. 388.

Specimens of this species in the Provancher collection are numbered either 869 or 698 and labelled *Osmia buconis* Say, and were reported by Abbé Provancher from Cap Rouge.

Alcidamea alboscopatum Provancher.

1888: Add. Fauna Ent. Can. Hym. p. 425, n. 2, 457, ♀ (*Heriades alboscopatum*).

1896: Dalla Torre, Cat. Hym. v. X, p. 374, ♀ (*Heriades alboscopatum*).

Length 6 mm. Black; about the size and shape of *Microstelis lateralis*, finely closely punctured, except clypeus on which the punctures are coarse; clothed with fine white pubescence, vertex of head and disk of thorax almost bare but with scattering pubescence, face, cheeks, pleura and thorax beneath thickly clothed, first tarsal joint clothed densely beneath, abdominal segments 1-4 with narrow apical hair bands, interrupted on segment 1, missing on segment 5, sides of all the segments fringed, scopa very scanty; clypeus with minute indentation in central apical margin, a tuft of hair projecting from beneath on each side, mandibles reddish at tips, two teeth only visible; antennæ fuscous beneath; legs reddish-brown (only one front leg, one middle leg minus claws, one hind leg and femora of the other present); tegulæ tinged with red, veins of wings fuscous, wings very slightly cloudy.

Redescribed from one ♀ specimen in the Provancher collection numbered 1521 and reported by Provancher from Cap Rouge.

This is a very neat little species, and is apparently a good species of *Alcidamea*. The teeth of the mandibles are not fully visible, but the wing-venation and structure of base of first abdominal segment will place it in this genus.

1888: Add. Fauna Ent. Can. Hym. p. 331-332, n. 24, p. 445, ♀, ♂ (*Alcidamea pilosifrons*). Provancher's descriptions above noted may be considered as placing the species referred to in the above reference under this species. I have not seen the specimens which he states are from "Ottawa (Harrington)."

Andronicus cylindricus Cresson.

1882: Le Naturaliste Canadien, v. XIII, p. 226, 229-230, n. 6, ♀ (*Megachile brevis*).

1883: Fauna Ent. Can. Hym. p. 710, 713, n. 7, ♀, ♂ (*Megachile brevis*).

1888: Add. Fauna Ent. Can. Hym. p. 324, 327, n. 12, p. 467, ♀ (*Osmia spoliata*): p. 462 (*Megachile brevis*).

1896: Dalla Torre, Cat. Hym. v. X, p. 412, ♀ (*Osmia spoliata*); p. 422, ♀ (*Megachile brevis*, Prov. references).

I have examined two females, one numbered 1478 and labelled *Osmia spoliata* Prov., the other 1014 and labelled *Megachile brevis*. Although Provancher in 1883 refers to the ♂ of *Megachile brevis* there are no specimens in the material sent me. Since the ♂ of this species is so readily separated from others closely related by the shape of the antennæ it is likely that the reference is to another species.

1888: Add. Fauna Ent. Can. Hym. p. 330-331, n. 23, ♂, p. 447, (*Andronicus cylindricus*). The above reference is to a species reported from Ottawa and Cap Rouge by Provancher. I have not seen the specimens mentioned, but the reference is doubtless correct, since the ♂ of this species is easily recognizable.

HERIADINÆ.

Heriades carinatum Cresson.

1882: Le Naturaliste Canadien, v. XIII, p. 233-234, ♀, ♂.

1883: Fauna Ent. Can. Hym. p. 717, ♀.

1888: Add. Fauna Ent. Can. Hym. p. 457.

1896: Dalla Torre, Cat. Hym. v. X, p. 375, ♀ (Provancher reference).

I have examined two ♀ ♀ and one ♂ of this species, numbered 879 and recorded from Cap Rouge and St. Hyacinth.

Chelostoma ? californicum Cresson.

1895: Le Naturaliste Canadien, v. XXII, p. 190, ♀, ♂ (*Heriades albicinctum*).

There is a single ♂ specimen in the Provancher collection, that I have seen. Provancher mentions and describes both ♂ and ♀ and records them from Los Angeles, Cal., collected by Mr. D. W. Coquillett. The male bears the number 1733. The female described by Provancher has two teeth on the clypeal margin and a white scopa.

STELIDINÆ.

Chelynia Provancher.

1888: Add. Fauna Ent. Can. Hym. p. 322, n. 22 (in *Panurgidæ*, type *labiata*).

1896: Dalla Torre, Cat. Hym. v. X, p. 180 (in Panurgidæ).

1898: Ashmead, Psyche, v. VIII, p. 283 (Melanostelis, type *betheli*).

This genus was founded on "*labiata* n. sp.," which is identical with Cresson's *nitida*. I have examined Cresson's type specimen, Provancher's type of the genus, and specimens of Ashmead's genus *Melanostelis*.

The Cockerell species placed in this genus do not belong here as can be readily seen by an examination of the descriptions, which show that they are not Stelidinae. Provancher very distinctly states that the abdomen of *labiata* is banded, referring to *color-bands*.

Chelynia nitida Cresson.

1888: Add. Fauna Ent. Can. Hym. p. 322, ♀, ♂, p. 450 (*Chelynia labiata*).

1896: Dalla Torre, Cat. Hym. v. X, p. 180 (*Chelynia labiata*).

The species in the ♂ at least is identical with Cresson's *nitida*, the types having been compared. They are almost exactly the same size; the ♀ type of Provancher has not been seen. The species was collected in "Ottawa".

Stelis fæderalis Smith.

1888: Add. Fauna Ent. Can. Hym. p. 336, ♀, ♂, p. 472.

The single specimen in the collection that I have examined is unfortunately minus its abdomen. It appears to be a *Chelynia* and perhaps is *nitida* Cr. It bears the numbers 1114 and 22 and the species is reported by Provancher from "Ottawa (Guignard)."

Microstelis lateralis Say.

1888: Add. Fauna Ent. Can. Hym. p. 425, n. 3, ♂, 457, (*Heriades plenum*).

1896: Dalla Torre, Cat. Hym. v. X, p. 379 (*Heriades plenus* D. T.).

The single male examined is numbered 1637 and is recorded by Provancher from "Ottawa (Guignard)." It has three dots on each side of first three segments, a line on each side of each of the segments 4 and 5, these lines being short and rather nearer the centre than the outside; recurrent nervure interstitial, veins brown, tegulæ black, hairy and punctured; face and body very slightly pubescent; legs brownish; front of first segment of abdomen polished, not punctured and with an abrupt ridge above.

Microstelis maculatum Provancher.

1888: Add. Fauna Ent. Can. Hym. p. 323, ♀ pp. 435, 457 (*Heriades maculatum*).

1896: Dalla Torre, Cat. Hym. v. X, p. 378 (*Heriades maculatum*).

Length 4 mm. Black; pubescence white with a few scattered hairs black on thorax; rather finely punctured, tegulæ coarsely punctured; and with a fuscous spot, tibiæ and tarsi tinged with reddish, claws cleft, spurs pale yellow; antennæ fuscous; an oblong yellow macula on each side of segments 1-3 dorsally; clypeus slightly emarginate; 2d joint of labial palpi slightly longer than the first; wing veins fuscous, 1st recurrent nervure fails to reach the submarginal cells in either wing, 2d recurrent nervure uniting at apex or very slightly beyond apex of second submarginal cell, 1st submarginal cell longer than second, basal nervure interstitial, wings slightly cloudy.

Redescribed from the type specimen, a male, in Provancher collection, and numbered 1105 and 40, and recorded as having been collected by Taylor at Vancouver, B. C.

ANTHIDIINÆ.

Anthidium collectum Huard.

1896: Le Naturaliste Canadien, v. XXIII, p. 9, ♂ (*Anthidium compactum*).

1896: Huard, Le Naturaliste Canadien, v. XXIII, p. 123-124 (*Anthidium collectum*).

Length 10 mm. Black with deep yellow markings; pubescence sparse, mostly white, griseous on dorsum of thorax; yellow on clypeus, sides of face to just above base of antennæ, mandibles except black tips and margins, elongate spot above each eye, tegulæ with spot before and smaller one behind, minute spot on base of wing, minute spot below tegulæ, all tibiæ with exterior stripes, not broad except on anterior pair, and at apex of middle pair, interrupted on posterior pair in the middle, first tarsal joint with outer stripe, all abdominal bands interrupted in the middle, that on segment 6 swollen into two large spots, segments 1-3 interrupted on sides, 3 only slightly so on left side in one specimen, central spots on first segment minute, bands on segments 4-5 deeply emarginate, antero-laterally, outer portions much the largest; last tarsal joint red, claws bifid but not deeply swollen at base, with a black band across the middle; 6th dorsal segment with sharp lateral spines, 7th trilobed, exterior lobes broad and straight outwardly black, central spine black, short.

Redescribed from the one male specimen in the Provancher collection numbered 1729 and from 5 male specimens in the U. S. National Museum collection. All these specimens were collected by D. W. Coquillett in July in Los Angeles Co., Cal. The specimen in the Provancher collection is headless. Huard renamed this species, *compactum* being preoccupied by *compactum* Smith.

Anthidium tricuspidum Provancher.

1896: Le Naturaliste Canadien, v. XXIII, p. 10, ♂.

Length 11–12 mm. Black with ferruginous and deep yellow markings; pubescence white, rather sparse; the following parts yellow, clypeus, sides of face to just above base of antennæ, mandibles except black tips and margins, circular spot behind eyes at summit, tegulæ with large spot before and small one behind, minute spot at base of wing, elongate spot below tegulæ, two lines on border of scutellum, spot on middle and hind coxæ behind continued onto sides outwardly, all the tibiæ with broad stripes outwardly, first tarsal joint with broad outward stripe, first joint of middle and posterior tarsi with a spot on outside, narrow bands on all femora at apex, spot on side at apex of anterior pair, abdominal segments 1 and 2 with four nearly equidistant spots, inner ones on segment 1 small, segments 3 and 4 with bands sharply emarginate in middle and at sides, 3–6 slightly notched medially behind, 5 and 6 notched medially anteriorly, yellow on segment 6 extending onto the lateral spines; abdomen more or less ferruginous behind; punctuation of abdomen fine but not confluent, of thorax and head very close, especially so on dorsum of thorax; claws slightly cleft; 2d joint of labial palpi longest; basal nerve of wings received far before the transverse nervure which is curved outwardly.

Redescribed from one male specimen in Provancher collection marked 1728 and 209 and one male in collection U. S. National Museum, marked 209 Coquillett. These two specimens were collected by Mr. D. W. Coquillett in August in Los Angeles Co., Cal.

Anthidium angelarum n. sp. ♀.

Length 9.5 mm. Black with deep yellow markings on the following parts: clypeus except two black spots near upper margin, and the anterior margin, triangular side pieces extending a little above the base of the antennæ, interrupted line on occiput the inner points reaching to the outer ocelli on each side, mandibles except black tips and margins, large anterior and small posterior spot on tegulæ, elongate spot below tegulæ, anterior mesothorax with a line on each margin extending back along sides almost to tegulæ, scutellum with 4 spots, front femora with short stripe behind near apex, tips of all the femora with a long narrow stripe outwardly, bands on abdominal segments 1–5, large spots on segment 6, bands on 1–4 interrupted medially, also interrupted on sides on segment one, incised antero-laterally on segments 1–4, most deeply on 2; pubescence very sparse and white, tarsi densely pubescent with brownish hairs and silvery hairs which are darker towards tips, ventral scopa very white; claws cleft; basal nervure entering far before transverse, second recurrent entering second cubital at or closely behind the end.

Described from 5 females collected in Los Angeles Co., Cal., in April by Mr. D. W. Coquillett, from one female marked S. Cal. on yellow label, and from one female in the Provancher collection labelled *Anthidium montivagum*, No. 1730. Type No. 9034 U. S. National Museum.

Dianthidium provancheri, n. sp. ♂.

Length 6.5 mm. Black, small closely allied to *ulkei*, *ehrhorni* and *simile*. Yellow on clypeus, supraclypeal triangle, sides of face almost to summit of eyes, upper portion much narrowed, line on outer orbits extending one-third of way from eye to summit downward, mandibles except margins and tips, elongate spot on each side of anterior margin of mesothorax near scale, scale large, thin with a central spot, spot on outer edge of tegulae, elongate narrow line on each side of scutellum separated posteriorly by the emargination of the scutellum, bands on all abdominal segments except sixth and seventh, first segment with line in middle and irregular spots laterally, segments 2-5 with bands interrupted medially and strongly incised behind, segment 7 black at base, narrowly yellow beyond, strongly trilobed, the tip of the pointed central tooth darkened, outer lobes rounded outside but sharply straight inside, margins transparent, central lobe of tooth longest; anterior femora above and below, tibiae above with reddish yellow stripes, middle and hind femora brownish red beneath, yellow at apex, tibiae yellow above, dark beneath, hind tibiae outwardly yellow at base and apex (in some specimens the black portion is nearly obliterated), tarsi reddish brown, first joint with a yellow stripe above, coxae dark except for short stripes anteriorly which pass onto the large yellow spines; clypeus reddish-brown along margin; punctuation very dense and regular; claws slightly bifid; wings dark, basal nervure commencing before transverse nervure, 2d recurrent nervure not ending quite so far beyond apex of second submarginal cell as first recurrent nervure does beyond the apex of first submarginal cell; pubescence sparse white and yellow, dark yellow hairs lying flat at sides of postscutellum and projecting inward giving the appearance of a color line, group of yellow hairs behind base of wings, hair on face yellow and on thorax above yellow on pleura and beneath thorax white, pale on legs, white and very sparse on dorsum of abdomen, rather plentiful along abdominal edges and on last ventral segment; middle and hind spurs deep red, front spurs pale.

Described from one specimen in the U. S. National Museum, type No. 9033, and one in the Provancher collection, this latter numbered 1667 and 327; both specimens are from Los Angeles Co., Cal., collected by Mr. D. W. Coquillett. The Provancher specimen was labelled *Anthidium simile*.

There is a female in the Provancher collection labelled *Anthidium palliventre*, which I believe to be a new species. It is however, very closely related to several other species from

that region. It is numbered 1535 and was collected in Los Angeles Co., Cal., by Mr. Coquillett. A specimen evidently belonging to this same species is in the U. S. National Museum from the same locality, but has lost its abdomen.

I have not seen the *Cælioxys* (*C. rufitarsis*, *C. mæsta* and *C. tristis*) recorded by the Abbé Provancher.

NEW SPECIES OF SPHENOPHORUS WITH NOTES ON DESCRIBED FORMS.

BY F. H. CHITTENDEN, SC. D.

In three earlier papers on this genus, published in the Proceedings of our Society,¹ the writer has treated as many groups. There remain to be reviewed several more or less perfectly defined groups and a number of isolated species and other forms which do not possess easily discernible characters indicative of their position in a natural arrangement of the entire series. In the present paper the simplest forms, based on the structure of the tarsal joints, will be considered first, and those forms in which the third joint of the anterior and sometimes median tarsi are widest will be discussed later. Some questions of nomenclature will be taken up, as economic workers frequently inquire in regard to these matters, and it is preferable to have these questions considered in a technical paper.

Sphenophorus marinus, new species.

Of similar form to *inæqualis*; smaller and less robust; surface opaque black, with antennæ, tarsi, and lateral margin of the elytra piceous.

Rostrum two-thirds as long as thorax, stout, moderately arcuate, strongly punctate in basal three-fourths, especially coarse at the base, and finely sparsely punctate at apex, which is very slightly dilated but compressed and prolonged posteriorly into an acute point, strongly dilated over scrobes but scarcely more compressed than at apex. Head strongly but somewhat sparsely punctate. Eyes with a fine reflexed posterior margin, separated from the head by a strongly impressed wide extra-orbital line.

Thorax longer than wide by about the shortest diameter of the apical constriction; posterior two-thirds with sides nearly parallel; base strongly arcuate. Surface very coarsely, moderately, deeply and very densely to confluent punctate, leaving a distinct but irregular elevated median line, not quite attaining either apex or base and occasionally slightly interrupted; a few punctures coalescing near sides posteriorly, forming

¹ See Volume XII, p. 50, 1905.

a shallow fossa each side. Scutellum large subtriangular, concave at base, rounded at apex, nearly one-half longer than wide.

Elytra moderately acuminate; striæ moderately fine, deep, especially at base, with punctures much wider basally and not wider at apex. Intervals flat, subequal except third which is a little the widest, punctures large and placed at very irregular intervals except on first where they are smaller and twice as closely placed. Humeral and subapical callosities of moderate size, shining black and finely punctate, the latter prominent. Pygidium coarsely and deeply punctate.

Lower surface strongly and coarsely punctate, sparsely on metathorax and first abdominal segment. Legs finely punctate; tibiæ weakly sinuate on inner border, finely fimbriate, obliquely truncate at apices.

♂.—Pygidium wide and subtruncate at apex, with fringe of yellow hairs nearly uniform; ventral concavity distinct, shallow.

♀.—Pygidium narrow and rounded at apex, with hair normally in tufts at sides; first and second abdominal segments connate at middle, where the punctures are very sparse.

Length 4.8–6.0 mm.; width 1.9–2.4 mm.

Sea Isle City, N. J., June 10; Westville, N. J., collected by Mr. Charles R. Boerner, to whom we are indebted for this well-marked and interesting species. It is evidently maritime and probably very local.

Type.—No. 9449, U. S. National Museum. Cotypes in Mr. Boerner's collection.

This species is the smallest *Sphenophorus* occurring in the United States. The tarsal and tibial structure is similar to *parvulus* and *minimus*, which also have the same extraorbital grooves. The coarse subconfluent thoracic sculpture alone is quite sufficient for the separation of this species. The elevated median line of the thorax, the large concave scutellum, and prominent subapical callosities are also important characters.

The three species which have been mentioned are related to the *venatus* group. They may be classified as follows:

Thorax and elytra of about equal width.

Surface with fine cinereous coating of argillaceous material; thorax densely, regularly reticulately punctate, median line absent or very thin. N. Y.—Ill., Fla.—Tex..... *parvulus* Gyll.

Surface with velvety brown coating; thorax sparsely, irregularly and coarsely punctate, median line absent or short. W. Pa.—Ill., Fla.—

Tex..... *minimus* Hart

Thorax distinctly narrower than the elytra.

Black without coating; thorax densely to confluent and very irregularly deeply punctate, median line long and broad. N. J. (coast),

marinus n. sp.

***Sphenophorus graminis*, new species.**

Black, moderately shining without coating, of robust appearance due to the elytra being much wider than the thorax.

Rostrum less than two-thirds as long as the thorax, robust, moderately arcuate, much compressed, most strongly at the apex; base moderately wide, suddenly and strongly dilated over the scrobes with dilated portion angular, very feebly or scarcely conalicate; interocular fossa round, shallow, sometimes indistinct; impressed line more or less indistinct, scarcely longer than the width of the rostrum over the scrobes; apex with a shallow concave triangular space on anterior face, subacutely rectangular on posterior face; surface finely moderately and densely punctate, gradually coarser in basal half. Head feebly, very sparsely punctulate.

Thorax (without apical constriction) nearly as wide as long, apical half arcuate, apical constriction strong; base distinctly bisinuate; surface somewhat densely and finely punctate, punctures nearly uniform except along the median line where there is a small narrow smooth space of varying extent (sometimes nearly absent) and at the middle of the basal margin where they are a little coarser and denser. Scutellum feebly concave or nearly flat.

Elytra about one-third wider than thorax and scarcely one-fourth longer than wide, moderately narrowed at apex; striae finely uniformly punctate, punctures not visible on the surface, sutural stria strongly curved outwardly at base; intervals flat, alternate in width, narrower ones finely uniseriately punctate, wider ones with two or three rows of similar punctures, antepenultimate interval depressed more or less strongly. Pygidium finely moderately densely punctate, each puncture with a short pale yellowish gray seta, apical tufts wholly wanting or exceedingly minute.

Lower surface finely, nearly uniformly punctate, punctures shallow and more dense than on thorax. Legs more sparsely and finely punctate than on thorax; tibiae feebly sinuate on inner surface and sparsely fimbriate; anterior tibiae with outer angle considerably prolonged. Anterior tarsi with third joint less than one-third wider than first.

♂.—Ventral concavity broad and shallow.

♀.—First and second abdominal segments connate or subconnate at middle. Pygidium comparatively broad.

Length 7-9 mm., width 2.8-3.8 mm.

The Dalles, Oregon, June 18, 19 (Hubbard and Schwarz); Laramie, Wyo. (Soltau); Salt Lake, June 25 (Hubbard and Schwarz), Salt Lake City, Utah, April 19 (Soltau); Cal. (coll. Ulke); Idaho (coll. Fall).

Observed by Messrs. Hubbard and Schwarz inhabiting the roots of a grass growing on dry sand hills at The Dalles, Oregon, sometimes a foot or so under ground.

Type.—No. 8966, U. S. National Museum.

The Wyoming and Utah specimens agree in having the abdomen proportionately narrower and the median smooth thoracic line and the apical tufts of the pygidium more distinct. This species is very generally labeled "*vomerinus*" to which it is related.

***Sphenophorus subopacus*, new species.**

Of nearly the same form as *vomerinus*, still duller black, punctuation finer and deeper and nearly uniform throughout. Rostrum less than half as long as thorax, narrow. Thorax very nearly uniformly punctate except near base, where it is more densely subrugosely punctate; smooth space very small, extending posteriorly from a point just in front of the middle. Scutellum not deeply sulcate. Elytra at base strongly sinuate and finely marginate, disk somewhat unequal; striae very narrow, punctures indistinct, first and third striae approximating at base; intervals flat, punctuation practically uniform, punctures same size as those of striae; intervals 1, 3 and 5 wider than 4 and 6, 1 with four rows of punctures at base, 3 beyond, 3 and 5 with three rows of fine punctures, 2 and 4 with from one to three rows. The second and third intervals from the margin are strongly depressed as in *graminis*. Anterior tibiae less dilated and not so prolonged laterally. In other respects there is so nearly an agreement of the type with *vomerinus* that a more elaborate definition is unnecessary, especially so in the absence of better material.

Length 9.5 mm., width 3.8 mm.

California (Ulke) two females.

Type.—In the Carnegie Museum at Pittsburg, Pa., co-type No. 8967, U. S. National Museum.

***Sphenophorus monterensis*, new species.**

Of very similar appearance to *graminis*, with the same shaped rostrum. Black, shining on ventral surface, opaque on dorsal.

Rostrum half as long as thorax, with distinct rounded interocular fossa and feebly indicated, wide, shallow sulcus; otherwise as in *graminis*.

Thorax two-thirds as wide as long, basal two-thirds subparallel, basal margin slightly bisinuate, apical constriction strong, surface somewhat densely and nearly uniformly finely punctate; a distinct smooth impunctate median line about as long as the width of the thorax and with extremities as near the apex as the base. Scutellum feebly concave.

Elytra about one-fourth wider than thorax; striae fine, somewhat feebly punctate, sutural stria moderately curved at base; intervals (except third, which is slightly elevated near base) flat, alternate in width, narrow ones irregularly uniseriately punctate, wider ones irregularly triseriately. Pygidium finely densely punctate, with pale yellowish apical tufts.

Lower surface finely sparsely punctate, more coarsely and sparsely on metasternum and last ventral segment. Legs polished, finely and sparsely

punctate; tibiae feebly sinuate on inner surface, moderately fimbriate, anterior tibiae with outer angle acutely or moderately produced; anterior tarsi with third joint widely dilated, more than one-third wider than first joint.

♂.—Ventral concavity moderately deep, especially deep in metasternum. Pygidium scarcely subtruncate, sides broadly rounded.

♀.—First and second ventral segments with fine dividing line. Pygidium with concave area each side with strong median dividing line.

Length 8.5 mm., width 3.2 mm.

California: Monterey Co. (Koebele); San Diego Co. (Coquillett); "Cal." (Riley and Ulke); Long Beach, June 15 (Fall); Fresno, May 25 (Schwarz).

Type.—No. 8969, U. S. National Museum.

The very close resemblance of this species to *graminis* is remarkable, considering the difference in the tarsal structure. There is a tendency toward a second row of punctures on the narrower elytral intervals and the outer angle of the anterior tibiae is of variable length. In one individual the legs are dark rufous. There is considerable variation also in the width of the third joint of the anterior tarsi, but these and other variations from the type are perhaps individual, although the presence of a larger series with definite localities may show that there are two species included under this name.

As to habits, the only available data are that it was collected by Mr. Schwarz associated with *S. ockreus* in wet ground on the banks of irrigating ditches, on the roots of a rush of unknown species.

Sphenophorus diversus, new species.

Slender, black, with antennae, portions of legs, apex of abdomen at sides, and margins of elytra, piceous.

Rostrum less than half as long as thorax, moderately arcuate and compressed, more strongly at apex than at base; apex flat on anterior face, rectangular on posterior aspect; at base fully twice as wide as at middle, strongly dilated above scrobes with acute angles; interocular fossa round and deep; scarcely canaliculate, and with impressed line faint, very short, about twice as long as the diameter of the interocular fossa. Surface coarsely but sparsely punctate, gradually becoming finer to the apex.

Thorax fully one-third as long as wide; apical constriction moderate; sides moderately arcuate. Vittae somewhat distinctly indicated by smoother, more finely and sparsely punctate areas, elevated in their posterior half; median extending from base to apical constriction, narrowed at each end to about half the width of the scutellum, widely and somewhat suddenly dilated at a point behind the middle, and becoming confluent with the lateral vittae just in front of the middle. Interspaces

in the form of two rows of six or more punctures gradually increasing in size to apical constriction, in posterior half with large, irregularly placed, and confluent, foveate punctures. In the posterior third there is also on each side a rather large oval slightly depressed area, with contiguous shallow punctures considerably smaller than those in the interspaces and much larger than the punctures of the sides, which are fine but distinct and sparse. Scutellum flat, shining, moderately declivous to base.

Elytra one-fifth wider than thorax, somewhat strongly narrowed to apex, where the surface is a little uneven. Striæ moderately fine and deep, finely and closely punctate (16-20 punctures on longest striæ); punctures short, oval on disc, round and shallow at sides. Intervals nearly equal in width and convexity; 1, 3, 5, and 9 partially biserially and very finely punctulate, others uniserially and scarcely less finely but less closely punctulate, 3 distinctly elevated in anterior half, 5 less distinctly; 8 and 9 considerably depressed and coated; humeral callosities small but well defined, subapical ones subtubercular. Pygidium very strongly, coarsely and densely punctate.

Lower surface strongly, coarsely, and moderately sparsely punctate, punctures not remarkably coarser on the sides. Legs a little less strongly punctate than middle of abdomen. Tibiæ sinuate, and finely fimbriate on inner surface, subapical spurs minute. Anterior tibiæ with inner spur acute and long, placed nearly at a right angle, outer angle slightly produced; middle tibiæ a little rounded at apex, posterior tibiæ obliquely truncate. Third joint tarsi: anterior one-fourth, middle one-fifth, posterior one-fifth+, wider than first joint.

♂.—Pygidium wider than long, broader and more broadly rounded at sides of apex, lateral tufts minute. Ventral surface much more uniformly punctate than in ♀, first and second abdominal segments weakly concave, third and fourth distinctly but sparsely punctate, last segment densely punctate and without finely punctate basal area.

♀.—Pygidium a little longer than wide, moderately narrowed and rounded at apex, strongly divided by a median carina, each side of which there is a large deep fossa; vestiture not visible, except at apex, where there are two minute tufts each side. Metasternum nearly flat, strongly divided at base, very sparsely but not coarsely punctate; first and second abdominal segments strongly convex, second and third with same punctuation except in posterior third or half, where the surface is impunctate. Last segment strongly and coarsely punctate except at apex and a small median area near base, which are finely and densely punctate. Femora glabrous.

Length 8.5 mm. (♀)—6.0 mm. (♂); width 3.9 mm. (♀)—2.5 mm. (♂).

California (1 ♀, coll. Ulke); Pullman, Wash. (1 ♂, coll. Fall).

Type.—In Carnegie Museum at Pittsburg, Pa.; cotype, No. 8968, U. S. National Museum, a donation from Mr. H. C. Fall.

In its thoracic sculpture this species bears some likeness

to *ulkei*, but the punctuation of the elytral striæ, as well as that of the intervals, is without a parallel in our representatives of the genus; in short, the species does not display any great affinity to any others known to the writer.

***Sphenophorus nevadensis*, new species.**

Form similar to *vomerinus*, more depressed, shining black.

Rostrum two-thirds as long as thorax, interocular fossa distinct, elongate-oval, with fine impressed line reaching to dilated portion above scrobes. Thorax as long or nearly as long as wide, sides nearly evenly strongly arcuate, a little more strongly anteriorly. Elytra one-fifth wider than thorax and fully one-fourth longer than wide. Striæ deep with much stronger punctures than in *vomerinus* group, visible on surface, less obvious apically, and stronger to the sides, somewhat distantly placed; penultimate and antepenultimate striæ indicated by large deep punctures, middle of sixth stria usually similar; intervals 1, 3, and 5 slightly concave or flat, closely and finely punctulate, either in one or two rows, the others less closely uniseriately punctulate except antepenultimate (9) which is biseriate. Pygidium densely punctate, coarsely except at apex where it is much finer, vestiture wanting or very sparse. Lower surface punctuated more finely than on thorax. Legs nearly as coarsely, but more sparsely punctate than on thorax. Anterior tibiæ obliquely truncate at apex. Third joint tarsi: anterior $\frac{1}{3}$, middle and posterior $\frac{1}{4}$, wider than first.

Length 8.5–9 mm., width 3.2–3.8 mm. A small individual measures 7 mm.

♂.—As in *graminis*, with which the species agrees very closely in characters which to save repetition have not been mentioned.

♀.—Pygidium narrow, acuminate to apex where it is narrowly rounded.

California (Roberts); Nevada (Ulke).

Type.—No. 8975, U. S. National Museum. Cotypes in Carnegie Museum at Pittsburg, Pa.

In the punctuation of the elytral striæ this species is unique, resembling somewhat *retusus* and *subulatus* in both of which, however, the intervals are convex.

***Sphenophorus fallii*, new species.**

Of similar form to *arizonensis*, more shining; elytra rufopiceous. Rostrum shorter, more suddenly compressed at apical fourth; interocular puncture elongate, terminating in a strongly impressed line extending beyond the scrobes. Thorax more finely punctate. Elytral striæ interrupted by less rounded more or less subcordate punctures more closely set, about 18 to each stria. Lower surface with last segment coarsely and deeply punctate. Anterior tibiæ truncate; subapical spurs feebly developed. Anterior and middle femora fimbriate in middle half. An-

terior tarsi with third joint transverse cordate, twice as wide as first spongy pubescent on under surface.

♂.—Ventral concavity moderately deep. Pygidium with feeble median, dividing line; apical tufts minute.

Length 8.3 mm., width 3.2 mm.

Santa Fé, New Mexico, August, 1887 (coll. H. C. Fall).

Type.—No. 9726, U. S. National Museum, 1 ♂.

This form might readily pass as the male of *arizonensis*, of which I have seen only the female, but for the spongy pubescent lower surface of the third joint of the anterior tarsi which throws the species into a distinct group. The characters furnished in the description indicate the main differences. Otherwise the two are remarkably alike.

Sphenophorus subulatus, new species.

Form slender, resembling *simplex*; general color polished black; antennæ piceous, and portions of legs more or less indistinctly piceous, dorsal surface sometimes piceous.

Rostrum three-fifths to four-fifths as long as thorax, somewhat feebly and uniformly arcuate, cylindrical, a little more compressed at base and narrowed at apex; apical fifth to third laterally subcarinate. Base somewhat feebly dilated, little more over scrobes, not canaliculate; interocular fossa inconspicuous, rounded; impressed line wanting or feebly indicated each side of scrobes, not extending to the fossa. Apex flat or slightly convex on anterior face.

Thorax about one-fourth longer than wide, nearly uniformly arcuate at sides to apical fourth, where it suddenly narrows to apex, the latter strongly constricted; surface more coarsely, sparsely, and deeply punctate than in *simplex*, with median smooth line half as long as thorax, extending from in front of middle and not attaining base; each side of median line the punctures are deeper and confluent. Basal margin nearly straight. Scutellum flat or channeled at middle.

Elytra one-fourth wider than thorax, one-half longer than wide, somewhat strongly narrowed to apex. Striæ half to nearly as wide as narrow intervals, coarsely and closely punctate, punctures encroaching on intervals gradually more strongly from sutural to lateral, where the striæ tend toward obsolescence. Intervals all convex, subequal except third, which is widest, alternately uniseriately and biseriately punctulate, 5 and 7 sometimes uniseriately. Pygidium coarsely and densely punctate, punctures becoming confluent at apex and at sides, glabrous except apical tufts at sides.

Lower surface coarsely and densely punctate, punctures deep, not varying conspicuously in size, except in the customary extreme places,

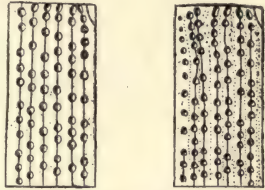


FIG. 19.—Sections of elytra, showing strial punctuation: *Sphenophorus arizonensis* at left, *fallii* at right,

those of sides being considerably larger than the middle on the third and fourth ventral segments. Legs strongly and somewhat finely punctate. Tibiæ densely fimbriate with short hairs. Third joint tarsi: anterior one-fourth, middle and posterior one-fifth, wider than first.

♂.—Ventral concavity somewhat faint, last ventral segment with large deep rounded fossa. Pygidium comparatively wide at apex, with sides somewhat broadly rounded.

♀.—Metasternum flat or nearly so, abdominal segments convex, the last narrowly transversely concave at the apex. Pygidium narrower at the apex and more broadly rounded than in ♂.

Length 8-9 mm., width 3.9 mm

New Mexico, 2 ♂ ♂, 1 ♀ (coll. Ulke). One male of this small series is much more finely punctate over the entire surface than the other two, otherwise it does not differ.

Type.—In the Carnegie Museum, Pittsburg, Pa. Cotype, No. 8970, U. S. National Museum (♂) through the courtesy of Dr. W. J. Holland.

This species is very different from any other *Sphenophorus* occurring in the United States, but three closely related forms in the National collection, from Mexico, display great similarity, evidence that the type may be a common one in Central America and that there may be many more species of this group in that region. The rostrum is more slender than in others of our fauna, while the anterior tibiæ are less dilated at the sides than in the *simplex* and *vomerinus* groups, and are very slightly angulate.

***Sphenophorus destructor*, new species.**

Of similar form to *zeæ*, proportions variable, but with an average width of four-tenths the length. Surface usually so thickly coated with dull clay-colored or pale brown argillaceous deposit that the punctuation, more especially of the elytra, is much obscured.

Rostrum three-fourths as long as thorax, moderately arcuate, nearly straight on middle half of anterior margin, feebly compressed in the middle third, thence widening gradually to the apex, which is subobtusely angled behind. It is slightly protuberant above the eyes, considerably dilated in front of the scrobes, and somewhat deeply and broadly channeled from the base to a little beyond the scrobes, this channel frequently filled with argillaceous deposit; surface rather deeply and densely punctate, at base coarsely. Head moderately finely and sparsely punctate.

Thorax a little longer than wide, posterior half with sides nearly parallel, anterior half strongly arcuate, moderately constricted at apex, strongly bisinuate at base; surface irregularly trivittate; vittæ variable, tending toward obliteration in some individuals, middle vitta irregular elongate fusiform, with an irregular, interrupted, shining, black, elevated line

extending from apex to near base, sometimes only half as long, rarely but slightly indicated; lateral vittæ sinuate, narrower than median, their most elevated portion showing in a very irregular much interrupted shining black line; surface of vittæ very coarsely, irregularly, rather sparsely, punctate, intervals still more coarsely sparsely punctate; a large shallow fossa each side of the apical half of the thorax and a similar deeper fossa each side of the base. There is usually an indistinct branch of the lateral vittæ. Scutellum opaque or subopaque, channeled.

Elytral surface comparatively even, with obscure punctuation. Striæ moderately, deeply, coarsely and remotely punctate, about 12 punctures on the sutural and next three striæ, so closely placed as to form at the base four small shallow fossæ between alternate intervals; intervals very irregular owing to the large elytral punctures, alternately very slightly elevated, elevated intervals closely uniseriately punctulate, the others half as closely punctulate, the third with a tendency to produce 2 rows of fine punctures. Pygidium rather coarsely, deeply and sparsely punctate, with short golden yellow hairs and short lateral apical tufts.

Lower surface very coarsely, sparsely punctate, at the sides scarcely different from the middle and the lower surface of the thorax; second, third and fourth ventral more finely, apex of last segment densely and coarsely punctate. Anterior tibiæ with inner apical tooth moderately long, subapical less than half as long and obtuse. Third joint of tarsi: anterior and middle about one-fourth or one-fifth wider than the first joint, of posterior tarsi scarcely wider.

♂.—Pygidium subquadrate. Ventral concavity broad and very shallow.

♀.—Pygidium distinctly narrowed to rounded apex. Metasternum, first and second abdominal segments flat, the last two connate or nearly so.

Length 7.0-9.5 mm., width 3.2-4.0 mm.

Atoka, Mo., June 7, (W. J. Moss); Texas (Belfrage, Riley); Georgia City, Mo. (C. B. Guinn); Stillwater, Okla. (A. N. Caudell); Medora, Kans., May 22 (Knaus); Anglesea, N. J., June 15 (C. Boerner).

Type.—No. 8971, U. S. National Museum.

At first sight this species might be taken for an aberrant form of *zeæ*, and this applies particularly to large individuals, but it is more nearly related to *callosus*, and occupies a position about midway between these two as regards the thoracic pattern. A somewhat striking character is the distinctness of the four thoracic and six basal elytral fossæ in clean well-marked individuals and the coarsely punctate elevated lines of the vittæ. The smallest individuals seen, *e. g.*, the eastern ones, are less strongly marked than the typical Texas and Kansas examples, approaching *callosus* in the sculpture of the thorax but differing by being proportionately stouter.

This species has been reported as quite injurious to corn

in portions of Missouri from 1884 to 1903, and to chufa (*Cyperus esculentus*) in Oklahoma.

Sphenophorus sublævis, new species.

Very similar to the above but distinguishable by its uniform dull black color due to the absence of argillaceous coating and by having much deeper, coarsely foveate punctures on the entire dorsal surface. The rostrum is more protuberant in front of the eyes, more strongly compressed, and the apex is acutely or subacutely angled posteriorly. The elevated portions of the thoracic vittæ are much wider, without elevated lines. The four fossæ are scarcely indicated. The elytral surface is much more irregular and the very deep and large strial punctures and more minute punctures of the intervals are conspicuous. The apical tibial spurs are very long as are the subapical spurs, the latter being nearly as thick and half as long in the anterior pair. Pygidium with much paler, scarcely yellow hairs. Sexual characters about as in *destructor*.

Length 9-10 mm., width 3.5-4.2 mm.

Indiana and Wisconsin (Wickham); St. Louis, Mo., July 10, 1873 (C. V. Riley); Champaign, Ill., April 23; Cook Co. Ills. (Hart).

Type.—No. 8972, U. S. National Museum.

Sphenophorus callosus Olivier. (Fig. 20).

Calandra callosa Olivier, Hist. Nat. des Ins., Vol. V., p. 92, Pl. XXVIII fig. 416, 1807.

Sphenophorus sculptilis Horn (*nec* Uhler) Proc. Am. Phil. Soc. p. 424 1873.



FIG. 20.—*Sphenophorus callosus*.

This species was united by Le-Conte¹ and Horn with *cariosus* Ol., but wrongly so, as I shall attempt to prove. Olivier's description reads in substance as follows:

Body black with dark cinereous coating. Antennæ brownish black, shining, cinereous at apex. Rostrum black, *dark cinereous at base*. Thorax uneven, "and one sees on the superior portion an elevation in the form of a cross, feebly marked." Elytra uneven, feebly varicose, marked toward the apex with a callous point, nearly spinose, blackish, shining.

Olivier's illustration is imperfect in that it is very crude, showing neither punctuation nor sculpture and the general impres-

¹ Rhynch. N. A., p. 425.

sion is that of a shining species, which was certainly not intended. The thorax is a little short, otherwise the form coincides with the species which is figured herewith.

The cinereous base of the rostrum is an important character, as it signifies that a considerable portion of the base is coated while in *cariosus* it is not. The cross-like elevation of the thoracic disc is aptly described as *feebly* indicated, in fact is requires a little imagination to discern it in many individuals; moreover, it is not shown in Olivier's figure. In the true *cariosus* the cross is black, shining and well-marked, and the cariniform base of the third elytral interval which is always present is so prominent as to attract the attention of the veriest tyro.

The type locality "Carolina" will answer for either species. North Carolina appears to be the metropolis of *callosus*.

Sphenophorus cariosus Olivier.

Sphenophorus sculptilis Uhler, Proc. Acad. Nat. Sci. Phila., 1855, p. 416

As the original description of *sculptilis* may not be accessible to many, it is transcribed below together with italicized words of my own and brackets to indicate portions of the description which are not specific.

Entirely black, elevated portions shining; thorax with a *sphenoid*, posteriorly acuminate, medial, and two undulating, *prominent* elevations. $8\frac{1}{2}$ lines long to tip of rostrum. Baltimore.

Black punctured; rostrum, rather robust, *finely punctured at base sulcated* [and dilated immediately in front of base; club of antennæ, whitish at tip; thorax round, constricted in front, and slightly dilated a little before the middle], densely and coarsely punctured at sides, and between the elevations, puncta becoming finer anteriorly; scutel deltoid, excavated; elytra with *two elevated*, interstitial lines, a *prominent* elongated tubercle each side behind the humerus, and a *round* one near the apex of each elytron, sutural lines slightly elevated; [the three medial, and subsutural ones a little punctured at base; pygidium somewhat coarsely punctulate, punctures becoming finer at base; legs finely punctulate, patella more coarsely so; a large deep fovea upon the base of the postpectus, posteriorly; venter with gradually enlarging punctures, increasing in size toward the base].

After carefully comparing several species with this description I have come to the conclusion, in the absence of a knowledge of the whereabouts of Uhler's type, which cannot be located and may be destroyed, that it was based upon a somewhat unusually large specimen of *S. cariosus*, which measure somewhat less than " $8\frac{1}{2}$ lines" including the rostrum. Horn, in his

synopsis, recognized *zeæ* Walsh as distinct from *sculptilis* Uhl., but while the former is correctly described, showing that he had the Walsh species, he states of the second; "Body above entirely covered with dense argillaceous coating, ochraceous or pale brownish in color," which is never true of *zeæ* in any specimens which I have seen. Nevertheless LeConte¹ united these two species, sinking *zeæ* as a synonym of *sculptilis*, at the same time that the name *callosus* was suppressed in favor of *cariosus*.

To place Uhler's description in shorter words, it means a species about three-fourths of an inch in length, including rostrum, which is sulcated and finely punctured at base, "with *two elevated*, interstitial lines, a *prominent* elongated tubercle each side behind the humerus, and around one near the apex of each elytron." The rostrum of *zeæ* is neither sulcated nor finely punctate at base. Moreover, no species which I have seen other than *cariosus* would be apt to be described in the terms of the first three lines of Uhler's description and at the same time agree to the characterization of the elytra.

The *Calandra callosa* of Olivier, according to the writer's interpretation, is entirely distinct from *cariosus*, as will be seen by reference to figure 20.

Sphenophorus *zeæ* Walsh.

The name of this species, which was described in "The Practical Entomologist,"² and in the 3d Report of the State Entomologist of Missouri,³ may now be restored to technical entomology, as it has never been quite dropped out of economic writings. The description, and above all the figure, undoubtedly from Walsh's type or cotype, is unmistakable.

Sphenophorus *soltauui*, new species.

Body subfusiform, half as wide as long; subopaque black, elevated portions somewhat feebly shining, no trace of alutaceous coating.

Head deeply and rather densely punctate above the eyes, less distinctly and more sparsely on the vertex. Rostrum three-fifths as long as the thorax, irregularly feebly arcuate, considerably compressed; proximal fourth produced in front of the eyes, basal fourth variolately punctate, marked by a very short and fine median line (channel and interocular fossa wanting), strongly dilated at the sides, angles rounded; middle half of rostrum nearly straight and parallel as viewed from the side; apical fourth more compressed with inner angle not produced, obtuse.

¹ Rhynch. N. A., 1876, p. 425. ² Vol. II, p. 117. ³ Page 59.

Thorax longer than wide, posterior three-fourths moderately arcuate apical constriction very feebly, surface very coarsely, densely, unevenly punctate, punctures frequently confluent. The median vitta takes the form of an irregular smooth, unelevated space of varying length, and of a width about the same as an elytral interval; lateral vittæ absent. Scutellum sulcate with median line.

Elytral striæ irregularly, very deeply, coarsely, confluent punctate in the basal portion, becoming very narrow toward the apex. Intervals irregularly alternate in width and convexity, 1, 5, 7 uniseriately punctate except in the basal portion, third interval wider and distinctly biseriately punctate in basal half; intervals 2, 4, 6 more coarsely and sparsely punctate. Pygidium subtriangular, as long as wide at base; apex subacute, hairs whitish gray, apical tufts minute but distinct.

Lower surface moderately coarsely and moderately sparsely punctate. Anterior and middle tibiae with the outer angle somewhat feebly prolonged. Anterior and middle tarsi with third joint strongly, of the posterior feebly, dilated.

Length 7.5 mm., width 3.8 mm.

Greeley, Colo., April 22 (Soltau); Iowa City, Ia., May 21 (Wickham); Northern Illinois (coll. Roberts); Texas (coll. Ulke); Pittsburg, Pa., August (1 ex., H. G. Klages).

Type.—No. 8973, U. S. National Museum.

Sphenophorus blanchardi, new species.

Form moderately robust, resembling *scoparius* in size and proportions, general color subopaque black on dorsal, moderately shining on ventral, surface. Larger punctures filled with gray extraneous argillaceous material. Antennæ and tarsi slightly piceous, nearly black.

Rostrum two-thirds as long as thorax, moderately, nearly uniformly arcuate, except at base and apex, where it is perceptibly and about equally compressed. Base strongly dilated, fully twice as wide as at middle of rostrum, strongly and angulately dilated over scrobes; basal fossa large, deep and broad near head, usually ending in a distinct line beyond dilated portion of rostrum. Apex flattened on anterior face, usually concave, on posterior face more or less strongly and acutely produced. Surface strongly punctate, very coarsely at base and finely at apex.

Thorax about one-fourth longer than wide, moderately arcuate at sides; apex strongly constricted, with the extreme apical margin also strongly constricted on each side, the lower portion projecting beyond the upper. Surface very coarsely foveate-punctate, more finely on a slightly elevated area just in front of middle, and on two variable areas

(which resemble obsolete vittæ) on each side of basal half. The spaces separating these from the median area are most coarsely punctate. Basal margin strongly bisinuate. Scutellum broadly but not deeply channeled at middle.

Elytra one-fifth wider than thorax, one-third longer than wide, moderately narrowed toward apex. Striæ fine, very coarsely and sparsely punctate, with punctures nearly as wide as the intervals, which they distort. Intervals all convex except at base, strongly punctate; larger punctures foveate; 1 finely, closely, and irregularly biseriately punctate (sometimes uniseriately); 3 with two or three series of punctures in basal third or less and uniseriate in remainder; 5 and 7 narrower than 3, but similarly punctate; 2, 4 and 6 sparsely foveate-punctate, punctures more than one-third larger than on 1, 3 and 5; remaining intervals except at base very irregular and obscured by coating. Pygidium much exserted, finely punctured in proximal portion; remainder coarsely, deeply, and irregularly punctate; golden yellow hairs forming tufts each side.

Lower surface finely and sparsely punctate, varying as usual in the genus; legs strongly but much more finely punctate, tibiæ distinctly sinuate and somewhat densely fimbriate, with short black hairs. Third joint of tarsi: anterior and middle one-third, posterior one-fifth, wide than first joint.

♂.—Ventral concavity moderate, punctuation variable, disposed to be coarser than in female. Pygidium truncate at apex, with sides rounded.

♀.—First ventral segment strongly convex, the last with distinct fossa. Pygidium much narrowed at apex.

Length 10.5–12.5 mm., width 3.9–4.8 mm.

Texas. Described from 3 ♂♂ and 1 ♀.

Type.—No. 8974, U. S. National Museum (♂). Cotypes in the collection of Mr. Frederick Blanchard, who has kindly divided his material with our National Museum.

This species does not suggest any other in our fauna which has come to my notice. The projecting lower portion of the apical face of the thoracic constriction or collar is apparently peculiar to this species.

Sphenophorus striatipennis, new species.

Form of *costipennis*. General color red variegated with black, head and rostrum, median thoracic vitta, sutural intervals, abdominal segments, metepisternum, coxæ, knees, and tarsi black; somewhat weakly shining above, more polished on lower surface. Thoracic interspaces and elytral intervals with bright but light colored alutaceous coating. Rostrum less arcuate, not suddenly recurved and compressed in apical fourth; apex deeply concave on anterior face. Thorax less sinuate at base, median lobe more feebly prolonged; branch of lateral vitta less prominent. Elytral striæ fine and distinct, punctures small, distinct and

deep and closely set. Lower surface more strongly coarsely punctate, ventral segments, particularly 2, 3, and 4 more densely. Femora and especially tibiae more strongly fimbriate. Posterior tarsi same as middle, third joint strongly explanate, as wide as long, about twice as wide as first.

Length 9.5-12.5 mm., width 3.8-5.0 mm.

Chicago, Ill. (Chittenden); Indiana, Wisconsin, and Texas (U. S. N. M.); Marquette, Mich., July 14 (Hubbard and Schwarz); Spirit Lake, Ia., June (Wickham); Nevada and California (Ulke). Evidently somewhat rare.

Type.—No. 9727, U. S. National Museum.

The above description applies to the most distinct form of this species. There is, however, a color variation which does not seem deserving of a different name. It agrees with the typical form except in the fact that black is the predominating color; the vittae and intervals are all more or less shining black.

This species is quite closely related to *costipennis* but is distinct by the more fimbriate tibiae, wider third joint of the posterior tarsi, and stronger punctuation of the lower surface. The typical form is distinct by color alone, but the less strongly marked form is duplicated by a Michigan specimen of *costipennis* (1 in 300). This species as such was overlooked by Horn, as also by the writer, in considering species of the *peritinx* group. The former mentioned it, however, as a variety "with the upper surface red, with the sutural interval and the median vitta black. The under surface is red varied with black, and the legs also red with the knees black."

***Sphenophorus æqualis* Gyllenhal.**

This common, well-known species is quite different from *ochreus* Lec., the former being an eastern, the latter a western form; in fact, the two species are quite as distinct by many characters, more particularly by the punctuation of the elytra and the coloration of the thoracic vittae, as are either from *discolor* Mann. The principal differences may be expressed in tabular form, as follows:

Body covered with thick coating, subopaque on dorsal surface.

Thoracic vittae *pale*, usually buff, distinctly elevated; median not wider at base than at apex; lateral with branch more or less indistinctly indicated; interspaces and sides distinctly *deeply* somewhat irregularly punctate. Scutellum coated, pale.

Elytral striae with moderate *rounded* and deep punctures.

Metasternum, first and second ventral segment ♂ concave and villous at middle; interior surfaces of femora and tibiae ♂ strongly

- fimbriate. Anterior and posterior femora ♀ feebly fimbriate.
 Atl. Sts.—S. Dak.,*æqualis* Gyll.
 Body covered with thin, less dense coating, shining throughout.
 Thoracic vittæ *black*, less elevated; median wider at base than at apex; lateral without distinct indication of branch; interspaces and sides with *shallow* nearly uniform punctures. Scutellum not coated, shining black.
 Elytral striæ with smaller shallow, *oval* punctures.
 Metasternum, first and second ventral ♂ naked or feebly villous; interior surface of anterior and posterior femora ♂ feebly fimbriate as in ♀ *æqualis*. Posterior femora ♀ glabrous. Utah Mex.*ochreus* Lec.

NEW CULICIDÆ FROM THE WEST INDIES AND CENTRAL AMERICA.

BY D. W. COQUILLET.

The following new forms of mosquitoes were found among a very valuable collection made in the West Indies and Central America during the past summer by Messrs. August Busck and Frederick Knab, under the direction of Dr. L. O. Howard. Quite a large proportion of the species were bred from the larva state.

Tæniorhynchus flaveolus, new species.

Scales of proboscis yellow and with several black ones intermixed, those of the palpi mixed yellow and black, with a band of white ones at the sutures of the joints; palpi slightly widening at the apex; appressed scales of the occiput light yellow, the numerous upright ones brown. Body yellowish, scales of mesonotum and scutellum light yellow, the hairs black, scales of abdomen golden yellow, a few black ones on the first three and the last segment. Scales of legs mixed yellow and black, not forming distinct spots or bands, those on the apices of the joints of the middle and hind tarsi wholly black, on the broad bases of the last four joints white; claws of front and middle tarsi with a tooth under one of the claws, none under the other, hind tarsal claws simple. Wings hyaline, the scales oval, mixed black and yellow, not forming distinct spots. Length nearly 5 mm.

St. Thomas, W. I. A male specimen collected by Mr. A. Busck.

Type.—No. 8288, U. S. National Museum.

Mansonia fascipes, new species.

Distinguished by the coloring of the hind tarsi. Scales of palpi mixed

black and yellow, those on the apex white. Scales of proboscis mixed black and yellow and with several white ones beyond its middle, almost forming a band. Scales of occiput light yellow, those along the sides white, the upright ones chiefly brown. Thorax brown, its scales golden yellow. Abdomen purple-scaled, a patch of pale yellow ones near middle of sides of each segment; venter black-scaled, front angles of the segments whitish-scaled. Femora and tibiae black-scaled and with many patches of light yellow ones, the under side of the hind femora and inner side of their tibiae chiefly yellow-scaled; front and middle tarsi black-scaled, the first joint with many small patches of yellow ones, both ends of the first three joints and the whole of the last two, yellow-scaled; hind tarsi the same except that the third joint is wholly yellowish-scaled; tarsal claws simple. Wings hyaline, the scales black, yellow, and white, the latter collected into about seven spots, several narrow lateral scales on most of the veins. Length 5 mm.

Puntarenas, Costa Rica. Four females collected by Mr. F. Knab.

Type.—No. 8296, U. S. National Museum.

Gymnometopa, new genus.

Near *Stegomyia*, but the clypeus is wholly bare and the scutellum bears many narrow scales in addition to the broad ones. Scales of occiput broad, appressed and with several narrow, forked, nearly erect ones. Scales of legs appressed. Venation normal, the lateral scales of the veins rather narrow. Palpi of the male about as long as the proboscis, those of the female less than one-third as long.

Type: *Stegomyia mediovitata* Coq., from the West Indies.

The larva differs widely from that of *Stegomyia fasciata* in having many spreading tufts of rather long hairs scattered over the body, nearly as in the genus *Uranotænia*. *Stegomyia busckii* Coq. and *S. sexlineata* Theob. also belong to this new genus.

Gymnometopa albonotata, new species.

Like *busckii*, the only apparent differences being the presence of a silvery dot in middle of front margin of the mesonotum, and a distinct white band at base of first two joints of the front and middle tarsi and of each joint in the palpi of the male; the broad apices of the palpi of the female are white-scaled.

San Francisco Mts., Santo Domingo, West Indies. Five males and three females collected by Mr. A. Busck.

Type.—No. 8297, U. S. National Museum.

Dr. Dyar informs me that the larva is readily separable from that of *busckii*.

Culex knabi, new species.

Proboscis and palpi black-scaled; head, thorax and scutellum yellow,

their scales and hairs golden yellow, pleura with a few patches of white scales. Abdomen purple-scaled, front angles of the segments yellow-scaled; venter yellow-scaled and with an apical band of purple ones on the last four segments. Femora and tibiae purple-scaled, the basal half of the hind femora and the bases of the others, especially on the posterior side, yellow-scaled; bases of the first three tarsal joints white-scaled, covering nearly the whole of the first two joints on the middle and hind tarsi, scales on remaining portions of tarsi purple; all tarsal claws toothed. Wings hyaline, the scales brown. Length 5 mm.

Tehuantepec, State of Oaxaca, Mexico. Seven females collected by Mr. Frederick Knab, for whom this elegant species is named.

Type.—No. 8289, U. S. National Museum.

***Culex bracteatus*, new species.**

Near *confirmatus*, but the patch of scales on median portion of anterior half of the mesonotum is golden brown, instead of whitish. Proboscis and palpi brown-scaled, occiput brassy-yellow-scaled and with a patch of brown ones on each side. Scales in middle of anterior two-thirds of the mesonotum golden brown, those along the sides and on posterior third of the mesonotum deep brown, the latter intermixed with brassy-yellow ones. Abdomen black-scaled, a narrow band of whitish ones at base of each segment, expanded into lateral spots on the last three segments, venter whitish-scaled, the black of the dorsum encroaching on the hind angles of the first five segments. Legs black-scaled, the bases and large portion of the underside whitish-scaled; claws of front and middle tarsi toothed, those of the hind ones simple. Scales of wings brown. Length 3.5 mm.

Habana, Cuba. Four females collected by Mr. J. R. Taylor.

Type.—No. 7753, U. S. National Museum.

***Verrallina laternaria*, new species.**

Scales of proboscis black, palpi of male about as long as the proboscis, their hairs and scales black; occiput densely white-scaled and with a patch of black ones each side. Mesonotum densely covered with white scales, its bristles and those of the scutellum yellow. Abdomen black-scaled, a patch of white scales in the front angles of each segment, largest on the last three segments. Legs black-scaled, the apices of the middle femora and whole of the hind ones, except the base and a band before the apex, white-scaled; both ends of the first joint of the middle and hind tarsi, covering nearly the entire joint on the middle tarsi, and base of the second joint, white-scaled; claws of front and middle tarsi with one tooth under one of the claws, none under the other, claws of hind tarsi simple. Wing-scales brown. Length 3.5 mm.

Trinidad, West Indies. Five males collected by Mr. August Busck.

Type.—No. 8290, U. S. National Museum.

The genus *Verrallina* Theobald was founded on female specimens only and was referred by its author to the sub-family *Aëdeomyinæ*, but the present species clearly belongs to the *Culicinæ*.

***Tinolestes*, new genus.**

Near *Aëdes*, but the lateral scales of the veins of the wings are much broader and the palpi in the male much longer. Hairs of antennæ of male long and abundant, in the female short and sparse. Palpi of male nearly twice as long as the head, almost one-half as long as the proboscis, those of the female about as long as the head, less than one-sixth as long as the proboscis. Appressed scales of occiput narrow, a patch of broad ones each side, numerous upright forked scales on the occiput. Scales of scutellum very narrow, metanotum bare. Lateral scales of veins of wings broadly oblanceolate, a few nearly linear ones on basal half of wings.

Type: The following species:

***Tinolestes latisquama*, new species.**

Scales brown, the appressed scales of the occiput, venter, front angles of abdominal segments, coxæ, and under side of the femora at their bases, yellow. Front and middle tarsal claws of male with one tooth under one of the claws, none under the other, claws of the hind tarsi and all claws in the female simple. Length 3 mm.

Port Limon, Costa Rica. Seven males and five females collected by Mr. F. Knab.

Type.—No. 8298, U. S. National Museum.

***Micraëdes*, new genus.**

Near *Aëdes*, but the palpi much longer in both sexes. Palpi noticeably longer than the head, about one-third as long as the proboscis, apparently two-jointed, the apical joint slightly longer than the basal. Hairs of male antennæ much longer and more numerous than in the female. Clypeus bare. Occiput covered with narrow, curved scales and with many upright forked ones, the lateral portions covered with very broad, appressed scales. Scutellum bearing very narrow scales and six bristles on the median lobe. Scales of legs appressed. Venation normal, hind cross-vein over twice its length before the small, the lateral scales of the veins very narrow.

Type: The following species:

***Micraëdes bisulcatus*, new species.**

Scales of palpi and proboscis black, those of the occiput yellow. Mesonotum brown-scaled, a pair of subdorsal bare lines on its anterior three-fourths. Abdomen black-scaled, the front angles of the segments whitish-

scaled. Scales of the legs black, those on under side of femora basally whitish; claws of the front and middle tarsi of the male with a tooth under one claw, none under the other, those of the hind feet simple; female with all the claws simple. Scales of wings brown, Length about 3 mm.

Guadeloupe and Santo Domingo, West Indies. Two males and one female, collected by Mr. A. Busck.

Type.—No. 8291, U. S. National Museum.

The larva differs widely from that of *Aedes fuscus*; the body bears many large clusters of rather short, stiff hairs, and there are about eight tufts on the breathing tube.

Sabethoides undosus, new species.

Near *confusus*, but the dorsum of the abdomen is not white-scaled in the front angles of the segments. Scales of proboscis and palpi purple, those of the occiput violet-purple, a large patch of white ones each side. Mesonotum and scutellum mixed metallic blue-, green-, and coppery-scaled, the humeri violet-scaled, the lower portion whitish, scales of pleura white. Abdomen purple-scaled, scales of venter white or yellowish, the upper border wavy. Legs purple-scaled, the lower side of the femora and inner side of the tibiae brassy-yellow-scaled; tarsal claws simple. Wings hyaline, the scales brown. Length 3 mm.

Trinidad, W. I. Ten specimens collected by Messrs. F. W. Urich and A. Busck.

Type.—No. 8292, U. S. National Museum.

A NEW MYRMELEONID FROM THE UNITED STATES.

BY ROLLA P. CURRIE.

Brachynemurus irregularis, new species.

♀.—Hardly slender, yellowish, marked with light brownish; with black hairs, especially on the abdomen. Face yellowish, brownish above; inter-antennal mark rather short, emarginate, bordering the antennæ in front and sending a median line to the clypeus. Labrum about twice as wide as long, yellowish, rounded anteriorly. Palpi subequal, slender, cylindrical, yellowish, the last joint of each tinged with brownish piceous apically; last joint of labial palpi slender fusiform. Under parts of head yellowish; maxillary palpigers piceous at elbow (faintly) and near apex; a piceous clouding on each side of gula. Antennæ considerably shorter than head and thorax, strongly clavate, fuscous, articulations yellowish; joints 1 and 2 piceous, with yellowish articulations, 1 set in a yellowish ring. Vertex yellowish, with a pale brownish median stripe along longitudinal furrow, embracing a median fuscous spot on each side.

Thorax yellowish, with a broad longitudinal mid-dorsal stripe, divided lengthwise by a fine pale median line; on the anterior lobe of the mesonotum this stripe embraces a yellow spot each side, while on the anterior lobe of the metanotum it consists of two separate spots; on the posterior lobe of meso- and metanotum the stripe narrows posteriorly and terminates same distance before the hind margin of the lobe, on which there is a dark median small spot; lateral lobes of meso- and metanotum brown marked with yellow; posterior lobe of metanotum bordered in front with black; sides of thorax light brownish, spotted with yellowish; sterna mostly yellowish.

Abdomen yellowish, obscurely marked with brownish, especially on dorsal carina, lateral sutures, and articulations of segments, the apical half of abdomen darker; tip with a number of very stout black spines, the inferior appendages with long apical hairs. Legs yellowish, beset with large and small black spines and hairs; bases of spines, a ring before middle of tibiae (interrupted within), and tip of tibiae and tarsal joints, piceous. Tibial spurs hardly as long as first, and claws considerably shorter than fifth, tarsal joint.

Wings a little shorter than abdomen, rather broad, hyaline, tips pointed, the forewings obtusely; a series of fuscous spots between subcosta and radius, and faint cloudings on transversals, and on small forks at apex and hind margin of the wing. Longitudinal veins yellowish, interrupted at cross-veins and at forks with fuscous; cross-veins mostly fuscous, some of the intercostals interrupted with yellowish; pterostigma yellowish, fuscous within, a few intercostals forked before it. First cross-vein basad of radial sector curved around to meet the first cross-vein from radial sector to median vein (in the type specimen):

Abdomen 23 mm.; hind wing 21.8 mm.; greatest width of anterior wing 7.1 mm.; antenna 4.3 mm.

Columbus, Tex. (E. A. Schwarz, coll. C. V. Riley: 1 ♀); Columbus, Tex., June, 1879 (E. A. Schwarz, coll. C. V. Riley: 1 ex.); Havana, Ill. (C. A. Hart, Ill. St. Lab. No. 24,553).

Type.—No. 8313, U. S. National Museum.

In the second specimen from Columbus, Tex. the first cross-vein basad of radial sector (on the left anterior wing) sends a branch to the first cross-vein connecting radial sector and median vein, and there is an incomplete vein running from the second cross-vein basad of the radial sector towards the first. These peculiarities might not have been noticed were it not that the specimen from Havana, Ill. has a branch connecting all these cross-veins except the basal one (all but two basal ones in right hind wing), thus forming an almost complete double series of areoles in the space between origin of radial sector and the base of the wing. Mr. Nathan Banks

called my attention to the venational peculiarities in the Illinois specimen and suggested that it might belong to the genus *Calinemurus*. In that genus as characterized, however, the venation is even more irregular and there is a double row of intercostal areoles almost to the base of the wing (in *irregularis* a single row, with a few forked veins before the pterostigma). No one would, I think, regard the Texas specimens as sufficiently peculiar in venation to place them outside of *Brachynemurus*, for there are specimens of *B. mexicanus*, *niger*, *brunneus*, etc., also, in which one or two of the areoles nearest the radial sector are double; and it is evident that the Havana specimen is merely an example, of the species here described, in which these irregularities are carried further.

ON THE CLASSIFICATION OF THE CULICIDÆ

BY HARRISON G. DYAR.

I have previously thought from an examination of a considerable material of culicid larvæ, that there was no character to separate the *Aëdinæ* as larvæ from the *Culicinæ*. Further research has resulted in the interesting discovery that this is only so if Theobald's classification be used. A classification proposed by Dr. Lutz¹ and quoted in R. Blanchard's work "Les Moustiques," Paris, 1905, page 619, corresponds exactly with larval characters, and is evidently the best and most natural classification yet proposed. Doctor Lutz has arrived at this happy result, not by the use of any new characters but by changing the order of importance of the old ones. The relative length of the palpi in the sexes, heretofore regarded as a character of first importance, is relegated to a subordinate place and with obvious justice. This is a secondary sexual character, one that by some systematists is not allowed to be of even generic value. It should never have been used to define subfamilies. The worthless scale characters used by Theobald are discarded and most properly so. I am speaking of primary divisions, or subfamilies, not having gone into the question of genera in this connection. The scale characters may be of use in generic definition, although I doubt it.²

¹In C. Bourroul, Mosquitoes do Brasil, Bahia, 1904.

²See the complete refutation of the value of scale characters in generic definition given by James and Liston in their admirable account of the *Anopheles* of India. "A Monograph of the *Anopheles* mosquitoes of India," by S. P. James, M. D., I. M. S., and W. Glen Liston, M. D., I. M. S., Calcutta, 1904. See pages 19-21.

Theobald's classification is as follows, thrown into dichotomous form:

1. Metanotum nude 2
 Metanotum with chætæ 5
2. Palpi long in the male 3
 Palpi short in both sexes *ÆDEOMYINA*
3. Palpi long in both sexes *ANOPHELINA*
 Palpi of the female shorter 4
4. First submarginal cell much smaller than second posterior cell
 *MEGARHINA*
 First submarginal cell as long or longer than the second posterior
 cell *CULICINA*
5. Metanotum with chætæ only Genus *Wyeomyia*¹
 Metanotum with chætæ and scales *TRICHOPROSOPONINA*

The genera included in Volume I are as follows; the later additional genera do not essentially affect the scheme:

ANOPHELINA—*Anopheles*.

MEGARHINA—*Megarhinus*, *Toxorhynchites*.

CULICINA—*Janthinosoma*, *Psorophora*, *Mucicus*, *Eretmapodites*, *Stegomyia*, *Armigeres*, *Culex*, *Panoplites*, *Tæniorhynchus*, *Deinocerites*.

(Section, without name)—*Wyeomyia*, *Sabethes*.

ÆDEOMYINA—*Aëdeomyia*, *Aëdes*, *Hæmagogus*, *Uranotænia*.

TRICHOPROSOPONINA—*Trichoprosopon* (= *Joblotia*).

The following is Lutz's classification, thrown into tabular form and shorn of the superfluous descriptive terms:

1. Larvæ without respiratory siphon *ANOPHELINÆ*
 Larvæ with respiratory siphon 2
2. Proboscis curved *MEGARHININÆ*
 Proboscis straight 3
3. Metanotum without hairs 4
 Metanotum with hairs 5
4. Palpi long in the male *CULICINÆ*
 Palpi short in the male *ÆEDINÆ*
 *HÆMAGOGINÆ*
5. Palpi more or less long in the male *HYLOCONOPINÆ*
 Palpi short in the male *DENDROMYINÆ*

With the following genera:

ANOPHELINÆ—*Aldrichia*, *Anopheles*, *Arribalzagia*, *Cellia*,

¹ So given in the table but treated as belonging to the *Aëdeomyia*.

Cycloleppteron, Myzomyia, Myzorhynchus, Nyssorhynchus, Pyretophorus, Stethomyia.

MEGARHININÆ—Ankylorhynchus, Megarhinus, Toxorhynchites.

CULICINÆ—Acartomyia, Bancroftia, Culex, Desvoidya, Finlaya, Gilesia, Grabhamia, Howardina, Janthinosoma, Lasiocnops, Lutzia, Mansonia, Melanoconion, Mucidus, Psorophora, Skusea, Stegomyia, Tæniorhynchus, Theobaldia.

HÆMAGOGINÆ—Gualteria, Hæmagogus.

AËDINÆ—Aëdomyia, Aëdes, Aëdinus, Deinocerites, Ficalbia, Mimomyia, Uranotænia, Verrallina.

HYLOCONOPINÆ—Binotia, Gœldia, Hyloconops, Joblotia.

DENDROMYINÆ—Dendromyia, Limatus, Phoniomyia, Sabettinus, Sabettoides, Sabettus, Wyeomyia.

It will be seen that Lutz bases his primary divisions on larval characters, which is not allowable in a table for adults. The Anophelinæ should be separated on some adult character. The palpal character heretofore used is weak; but some other may be found, perhaps in the very long slender legs, or elongate thorax. The Megarhininæ are separated by Lutz on the curvature of the proboscis, which will not hold. By Theobald, the venation is used; but the character seems to me a weak one, as it consists in the relative degree of stalking of two pairs of veins only. I am inclined to throw the Megarhininæ in with the Culicinæ, where they fall near to Psorophora and Lutzia, the larvæ of these three genera being exclusively predaceous. The really strong character in Lutz's table is the presence or absence of setæ on the metanotum; the scales do not count. I think, and am supported by larval characters, that the rest of Lutz's subdivisions, based on the palpi, are weak and should be dropped. We have really only three subfamilies of the Culicidæ, definable on sound characters both as adults and larvæ.

I. ANOPHELINÆ. Adults¹: metanotum nude; palpi long in both sexes. Larvæ with sessile air tube; dorsal fan-tufts for attachment to the water film.

Genera.—Anopheles, Cella, Cycloleppteron, etc.

II. CULICINÆ. Adults: metanotum nude; palpi only rarely long in the female, usually long in the male, occasionally short in both sexes. Larvæ with an elongate air tube; no fan-tufts for attachment to the water film; anal segment with a ventral brush or rudder.

Genera.—Megarhinus, Psorophora, Lutzia, Culex, Grab-

¹ Some good adult character for the separation of the Anophelinæ can surely be found.

hamia, Howardina, Janthinosoma, Melanoconion, Stegomyia, Tæniorhynchus, Theobaldia, Hæmagogus, Aëdes, Deinocerites, Uranotænia, Verrallina, etc.

III. SABETHINÆ. Adults: metanotum with setæ; palpi short in the female, usually short also in the male. Larvæ with elongate air tube and no fan-tufts; anal segment without ventral brush.

Genera.—Joblotia, Dendromyia, Limatus, Phoniomyia, Sabethoides, Wyeomyia, etc.

I have given only the genera of which larvæ are known to me; but have no doubt that the other larvæ, when known, will prove consonant with these divisions.

Subdivision of the Anophelinæ, except generic, seems unnecessary. The Culicinæ can be divided into tribes, one the Megarhinini, to contain Megarhinus, Psorophora and Lutzia, the other, the Culicini, for the remaining genera. I see no propriety in recognizing the Aëdinæ or even Aëdini, as the character of short male palpi is not more than of generic rank and the larvæ show no differential characters whatever. The Sabethinæ need no subdivision, unless Joblotia be taken out, in many respects a unique form.

It has been shown that the Anophelinæ are distinguished by their attitude while alive; this is now given in all the text books. The Culicinæ and Sabethinæ are equally distinguishable, the latter curving the hind legs over the back far forward in a very characteristic manner, as described to me by Mr. Knab and Mr. Busck, who have seen many of the species alive.

OCTOBER 5, 1905.

The 198th regular meeting was held at the Sængerbund Hall and there were present the following: Messrs. Barber, Couden, Doolittle, Dyar, Heidemann, Howard, Marlatt, Morris, Quaintance, Schwarz, Stiles, Titus, and Webster, members; and Messrs. Boettcher, Clemons, Coleman, and Martin, visitors. In the absence of the executive officers Dr. L. O. Howard presided.

Prof. Hermann Muckermann, S. J., Sacred Heart College, Prairie du Chien, Wis., was elected a corresponding member.

Mr. Heidemann exhibited specimens and reported the capture of *Tettigia hieroglyphica* Say, family Cicadidæ, at Great Falls, Md. The species was described from Florida, and this is the first report of its occurrence near Washington, D. C.

Mr. Douglas Clemons was the first, on June 27, 1905, to notice the presence of this insect, and after securing one specimen, several parties were made up from the National Museum and attempts made to get additional ones. As a result of five trips, four specimens were captured. Mr. Clemons stated that these cicadas were very hard to locate among the tops of the tall trees. The throwing of stones and other missiles would not disturb them, simply making them sing the louder.

—Mr. Heidemann then exhibited specimens and presented the following notes on a species of *Ceratocombidæ*:

A NEW GENUS AND SPECIES OF THE HEMIPTEROUS FAMILY CERATOCOMBIDÆ FROM THE UNITED STATES.

BY O. HEIDEMANN.

Messrs. E. A. Schwarz and Douglas Clemons have lately found a new hemipteron which I identified as a ceratocombid. Members of this family are spread all over the world. In 1852, Prof. O. M. Reuter monographed the family, dividing it into two subfamilies, *Ceratocombinæ* and *Schizopterinae*. The first has 3 genera and 13 species, the other 6 genera and 14 species. More recently Prof. P. R. Uhler described some species from the West Indies and two others from Las Vegas Hot Springs, New Mexico. One or more additional species are known to me from the eastern States. Our peculiarly formed tiny insect, which is not much over 1 mm. long, belongs to the second subfamily. It has a striking resemblance to a species described by Reuter from New Caledonia,* *Hypselosoma oculata*. The general outlines are nearly the same, but judging from Reuter's figure our species differs in having a distinct raised venation with cross-veins forming a few cells on the elytra. Moreover, our species seems to have a broader head and comparatively shorter body, and I think we may safely consider it as representing a new genus.

Glyptocombus, new genus.

Body broad and oval, very convex, somewhat pointed towards the apex. Head transverse, its width taken from eye to eye half the length

* Monographia Ceratocombidarum orbis terrestris. Acta Soc. Scient. Fenn., XIX, No. 6, p. 26, 1863.

of the whole body, and broader than the basal part of the pronotum; vertex triangularly rounded, front depressed, vertical, clypeus small, narrow, slightly protruding in front, blunt at tip, transversely wrinkled and shining. Eyes extremely large, twice as long as broad, reniform, somewhat coarsely faceted. A remarkable feature is, that the eyes reach down to the lateral margins of the pronotum beyond the middle. Antennæ four-jointed and inserted in front of the eyes near the inner side; first two joints cylindrical, very slightly thinner towards the base, the others slender, beset with fine, long bristles. Rostrum three-jointed, quite robust, and a little curved. Pronotum twice as broad as long, moderately convex; lateral margins behind the eyes short; anterior margin between the eyes faintly depressed, with a transverse grooved line behind it, giving that part of pronotum a neck-like appearance; before the disk of the pronotum two smooth indentations; posterior

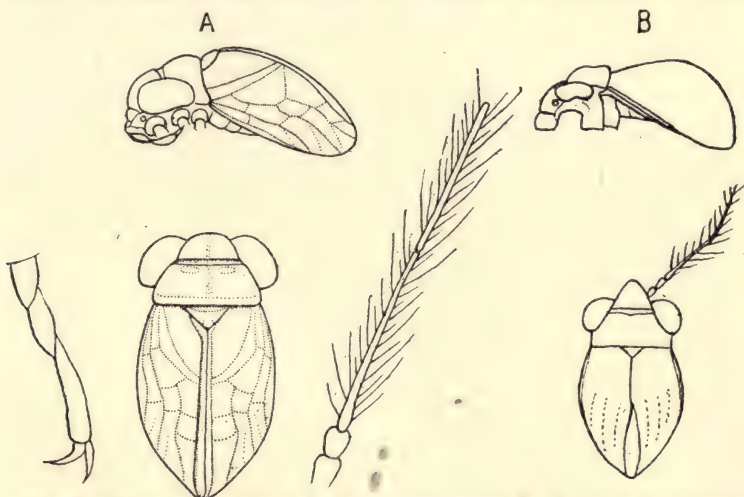


FIG. 21.—*Glyptocombus saltator*, A; *Hypselosoma oculata*, B. (B, copied from Reuter.)

margin slightly decurved. Scutellum broad, triangular, a deep impression near the base, the tip a little tumid. Hemelytra high and very convex, bending around the sides of abdomen and slightly surpassing the same; lateral margins of the elytra gently rounding from the base to behind the middle, then strongly curving to the apex. Veins and cross-veins very distinctly visible, a little raised, forming some cells. The inner margin of the elytra runs from the scutellum to the apex of the body and has the membrane subparallel, narrow, a little widening behind, where it is coriaceous like the elytra. The anterior cavity for the insertion of the front legs is very prominent and tumidly formed. Legs comparatively long; front femora not shorter than the tibiæ, the

latter a little inflated at tip; hind legs the longest, the femora not saltatorial, although the insect has the jumping habit; tibiae slightly longer than the femora; tarsi three-jointed, basal joint of the posterior tarsus a trifle shorter than the second joint. Abdomen highly rounded, a little shorter than the hemelytra.

***Glyptocombus saltator*, new species.**

Body dull blackish, sparsely covered with fine, silvery hairs, which are more dense on the pronotum and head. Eyes somewhat shining, black. Antennæ honey-yellowish, basal joint but slightly longer than second, the third a little abruptly thickened at base and nearly equal in length to the fourth, which is more hairy. Rostrum yellowish brown, reaching to the middle coxæ; second joint somewhat longer than the basal one; the last very short, much pointed, and darker at tip. Pronotum with a slight longitudinal impression and also a transverse one before the posterior margin; the surface finely rugulose. Lateral margins of the scutellum cinereously spotted. Hemelytra remotely but deeply punctured; the raised nervures covered with a cinereous film. Legs yellowish-brown, pilose, having also some short, stiff hairs; the femora, basal part of tibiae, and tip of tarsi darker. Underside of abdomen dull blackish and densely pilose, with the apex of the abdominal segments fringed, the last segment partly polished.

Length 1.2 mm.; width 0.6 mm.

Four specimens, Plummers Island, Md., September 9, 1905 (Clemons), October 4, 8, 1905 (Schwarz, Heidemann).

Type.—No. 9785, U. S. National Museum.

This species is most difficult to collect and is only to be found by sifting fallen leaves, rubbish, and earth. The collector must watch patiently until the minute insect makes its presence known by jumping, and even then it takes a skillful hand to secure it in a vial. After many efforts we collected only four specimens.

—Dr. Howard described a sifting machine recently made by Prof. Berlese, of Florence, Italy. He had had the good fortune to witness the machine in operation and hence could testify to its actual value as a collector. Briefly described, the sifter consists of a tray made of wire netting into which a bushel or less of the material to be sifted is placed. The tray rests on a funnel at the lower end of which is placed the collecting vial. This funnel is surrounded by a box containing water which is heated by means of a gas jet or alcohol lamp.

—Mr. Quaintance exhibited specimens of the larvæ, pupæ, and adults of *Tischeria malifoliella* Clemens, family Tineidæ. He also showed apple leaves mined by the larvæ. The leaves bore mines of four generations of larvæ, there being from 23 to 46 to a leaf. Larvæ of the fourth generation, it was stated, winter in the fallen leaves on the ground; some of these were also shown with the specimens in their winter quarters. The species was said to have been very abundant in the vicinity of Washington the present year; and specimens had been received by the Bureau of Entomology from Delaware, Maryland, Virginia, and Pennsylvania.

—Prof. Webster exhibited a necklace formed of earth pearls, *Margarodes trimeni* Giard, family Coccidæ. This coccid is found in South Africa on the roots of a species of *Rhus*. The natives collect the pearls and after stringing them sell them as the Indians do beads or the South Sea Islanders do shells. They are worn as necklaces, belts, and bracelets. Prof. Webster remarked on the variation in color of the different specimens from nearly pure white to brown and golden with greenish metallic lustre. Dr. Howard made a few remarks on the Jamaica specimens of *Margarodes* collected several years ago by the late Mr. H. G. Hubbard and exhibited before the Society. Mr. Hubbard's specimens had been cleaned very carefully and present a finer appearance than those usually seen.

—Dr. Dyar spoke of a futile attempt made to find larvæ of *Monoleuca semifascia*, family Cochlidiidæ, in North Carolina this year. This is the only species described from this region of which we do not now know the larva.

—Mr. Schwarz spoke of a difficulty experienced in the preparation of the lists of the insects collected on Plummers Island, Maryland—a difficulty that has also been experienced by the botanists—namely, that many common species the occurrence of which on the island is unquestionable could not be listed on account of the actual absence of specimens. One is so much more apt to pay attention to the rarer species than to pick up those common and well-known. Over 1,100 species

of Coleoptera are now known from this island which has an area of not more than six or seven acres.

—Mr. Barber exhibited specimens of the larvæ and adults of two species of *Phengodes* and also some photographs of different portions of the insects for comparison, and presented the following note:

NOTE ON PHENGODES IN THE VICINITY OF WASHINGTON.
D. C.

BY H. S. BARBER.

The following observations on beetles of the lampyrid genus *Phengodes* are deemed worth while recording, although they are mainly in corroboration of those made by Prof. George F. Atkinson and published some years ago.¹

During the past three years about a dozen larvæ or larviform females of *Phengodes* have been found in this vicinity, but males of the genus have not been taken here before this year, when two species were captured at Plummers Island, Md. (about 10 miles up the Potomac River from this city). They were *P. plumosa* and *P. laticollis*.

On June 17 of this year I found an adult female in the Zoölogical Park, about 11 o'clock on a bright moonlight night. Two nights later it was exposed in a jar with earth on Plummers Island and about quarter past nine o'clock a male (*P. laticollis*) was found attempting to enter the jar. Copulation, lasting about two minutes, was observed a few minutes later, and the act might have been repeated had not the male been removed in the hope of luring another. The male was not luminous.

On July 1, the female was observed rolled up in the soil and within the coil of her body about 20 eggs had been laid. On the 6th the number of eggs had been brought up to 53 or more. The female was then greatly shrunk and weak, but still alive and luminous. The eggs were not luminous.

The female retained luminosity till about August 10, when the jar became rather dry, but a few young larvæ were found to have hatched out a few days later. Owing to my absence during the next two weeks the jar dried out and all the young larvæ died.

¹ Journ. Elisha Mitchell Scientific Soc., Vol. iv, Pt. ii, p. 92, 1887.

Mr. Schwarz stated that the species described and figured by Dr. Erich Haase as *Phengodes hieronymi*¹ did not belong at all to this genus.

—Dr. Howard spoke of the remarkable change that has taken place lately in Italy in the old malarial districts around Rome and Naples. There are few mosquitoes present in those regions, and the disease has practically been wiped out by the use of the best sanitary means that could be found available by those in charge of the work.

¹ Deutsche Ent. Zeits., xxxii, pp. 155 ff., pl. i, 1888.

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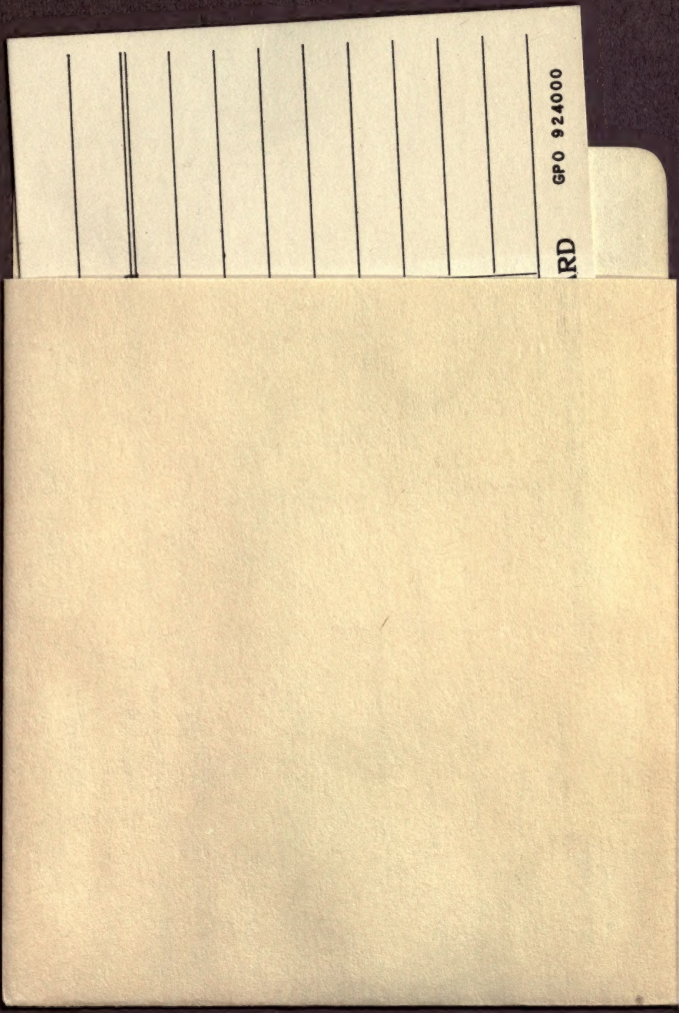
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ERRATA ET CORRIGENDA.

- Page 1, line 5, after Heidemann insert Hopkins.
5, line 12, for only read second.
17, line 13 from bottom, for *yathigerum* read *cyathigerum*.
19, line 14 from bottom, for *madidum* (Hagen) read *assimilatum*.
(Uhler).
50, line 2 from bottom, for + read \pm
105, line 12, for Oregon read Washington.
105, line 13, omit feeding.
105, line 13, for flowers read leaves.
128, line 4, for disposal read dispersal.
150, line 9 from bottom, for *Cyphophaga* read *Cyphopyga*.
157, line 3, for *parvula* D. T. read *nigritula* Friese.
157, after line 10 insert 1902: Friese, Zeits. f. Hym. Dipt., p. 109
(*O. ni gritula* n. n. for *parvula*).

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